**World Bulletin of Management and Law (WBML)**
**Available Online at:** https://www.scholarexpress.net
Volume-50, September-2025
**ISSN: 2749-3601**

# PROBLEMS AND PROSPECTS OF LEGAL REGULATION OF DIGITALIZATION IN THE INVESTMENT AND CONSTRUCTION SPHERE

**Egor Garanov, lawyer, USA**

**Article history:**

**Received:** 7th July 2025
**Accepted:** 6th August 2025

**Abstract:**

The article analyzes the problems and prospects of legal regulation of digitalization processes in the investment and construction sector of the United States. The impact of the introduction of digital technologies - BIM (Building Information Modeling), cloud platforms, artificial intelligence and blockchain - to transform construction project management. The author identifies key legal challenges, including the lack of uniform national standards for BIM, fragmented legislation at the federal and state levels, and the uncertainty of judicial practice regarding electronic evidence.

**Keywords:** Digitalization, investment and construction sphere, legal regulation, building information modeling (BIM), blockchain, data protection, construction law.

The scientific novelty consists in systematizing the problems of legal regulation of digitalization in the investment and construction sector of the USA, identifying the gap between technological practice (BIM, smart contracts, cybersecurity) and the regulatory framework, as well as proposing a comprehensive approach to the formation of effective regulatory mechanisms.

The investment and construction sector in the United States is one of the key sectors of the national economy. According to the US Bureau of Economic Analysis, in 2023, its contribution to the country 's GDP was approximately 4.3%, with more than 7 million people employed in the sector [1]. The development of the industry is inextricably linked with the introduction of digital technologies that help increase productivity, reduce operating costs, and improve the sustainability of projects.

One of the most significant areas of digital transformation is the use of building information modeling (BIM). Dodge Research Data & Analytics has shown that over 60% of US construction companies use BIM at the design stage, but its use at the building operation stage is significantly lower, at around 35% [2]. Despite its widespread use, the legal status of BIM in the US remains uncertain, as there are no federal or state-wide regulations governing its use.

Another important factor influencing the transformation of the industry is the use of blockchain, cloud platforms and artificial intelligence (AI) in the management of investment and construction projects. Organizations such as the American Institute of Architects (AIA) have developed standards for digital practice, but their application is advisory in nature [3]. A similar situation is observed with the National Institute of Standards and Technology (NIST) recommendations on cybersecurity, which, despite their relevance to the construction sector, are not legally binding [4].

The legal regulation of digitalization is complicated by the fragmentation of the US legislative system. The laws of individual states, such as California Consumer Privacy Act (CCPA), regulates data protection in the digital environment, but does not take into account the specifics of the construction industry [5]. As a result, legal gaps arise in terms of protecting design models, digital contracts and intellectual property.

Therefore, it can be stated that digitalization of the US investment and construction sector creates significant opportunities for its modernization. At the same time, it poses serious challenges to the legal system, requiring unification of the regulatory framework, strengthening the protection of digital data and development of judicial practice.

The US legal system, based on a combination of federal and state regulation, does not facilitate the formation of uniform standards for digitalization in the construction sector. Federal recommendations such as NIST Cybersecurity Frameworks are not mandatory, and regulations vary widely across states. This forces construction companies to adapt their digital workflows to different jurisdictions, which inevitably increases transaction costs.

Despite the widespread use of building information modeling (BIM), its legal significance in the United States remains limited. The NBIMS-US national standard is voluntary, and the use of BIM models as evidence in court proceedings is not regulated at the federal level [6]. This circumstance reduces legal predictability in contracting and dispute resolution.

**World Bulletin of Management and Law (WBML)**
**Available Online at:** https://www.scholarexpress.net
Volume-50, September-2025
**ISSN: 2749-3601**

American data protection laws are sector-specific. Laws such as California Consumer Privacy Act and Health Insurance Portability and Accountability Act, mainly regulate the protection of personal data in areas unrelated to construction. This creates legal gaps in relation to the protection of specific digital assets, including construction models and intellectual property.

The US judiciary is only beginning to consider issues related to the legal recognition of BIM models, smart contracts, and blockchain records as evidence. Currently, judicial practice on these issues remains extremely limited, which does not allow for the formation of sustainable legal precedents [7]. This situation increases the legal risks for companies investing in digital technologies.

The growing use of cloud platforms and Internet of Things (IoT) devices in the construction sector makes it vulnerable to cyber threats. According to a McKinsey report, about 75% of construction companies in the United States will experience cybersecurity incidents in 2022 [8]. At the same time, NIST recommendations, as already noted, are not mandatory, and there is no single industry standard for cybersecurity in the construction industry.

Table 1 - Main problems of legal regulation of digitalization in construction in the USA

| No. | Problem | Cause | Consequence |
|---|---|---|---|
| 1 | Fragmentary legal framework | Division of powers between the federation and the states | Different requirements in different jurisdictions, rising costs |
| 2 | Uncertainty of the legal status of BIM | The voluntary nature of NBIMS-US | Reduction of legal force of BIM models, disputes in contracts |
| 3 | Insufficient data protection | Laws are focused on personal data, not construction data | Risks of design model leaks, weak IP protection |
| 4 | Limited judicial practice | No precedents | Uncertainty in the Recognition of Digital Evidence |
| 5 | Cyber threats | Voluntary nature of NIST standards, lack of industry regulation | Attacks on construction companies on the rise |

Current trends in regulating the digitalization of the U.S. construction industry demonstrate a shift from disparate recommendations to more formalized requirements established by leading federal agencies and standardization organizations. This shift can be characterized by five priority areas.

1. Integrating NIST CSF 2.0 into Cyber Risk Management . In February 2024, the National Institute of Standards and Technology (NIST) released an updated version of Cybersecurity Framework 2.0 (CSF 2.0). This document expands the scope of the standard to include a new functional domain, «Govern», and strengthens the requirements for supply chain management [9]. These innovations make CSF 2.0 a useful basis for creating cybersecurity requirements for project data and the Common Information Environment (CIE). Data Environment (CDE) in contracts, especially for federal customers. Implementing CSF 2.0 into industry standards will significantly improve the cyber governance maturity of contractors and asset owners.

2. Institutionalization of BIM through NBIMS-US v4. The National BIM Standard (NBIMS-US v4) becomes the central reference point for data management and information exchange. The new version systematizes «BIM- use» (BIM use cases), data exchange requirements and PBR templates (Project BIM Requirements) [10]. Although NBIMS -US remains voluntary, its practical tools provide a clear basis for incorporating BIM requirements into contracts and specifications, which reduces legal uncertainty regarding the format, content and legal status of digital models.

3. «Soft Enforcement» Through Federal Standards: Federal agencies like GSA create «soft enforcement» for the entire industry through their standards like P100. The 2024 version of P100 includes updated and mandatory requirements for digital materials and BIM practices for federal projects [11]. This forces contractors working with GSA to implement appropriate processes and tools, which in turn helps create a de facto regulatory environment for the entire market, extending BIM practices beyond federal projects.

4. Unification of contracting practices with the AIA. The American Institute of Architects has developed a package of documents for digital practice, in particular G203-2022 (BIM Execution Plan), which helps project participants incorporate digital protocols into contracts [12]. Although AIA documents are advisory in nature, their widespread use has made them a de facto standard for contracting practice in

**World Bulletin of Management and Law (WBML)**
**Available Online at:** https://www.scholarexpress.net
Volume-50, September-2025
**ISSN: 2749-3601**

both private and public projects. This significantly reduces legal uncertainty regarding BIM model responsibility, data rights, and version control.

5. Distribution of «digital delivery» in infrastructure projects. FHWA Program Every Day Counts (EDC), implemented by the Federal Highway Administration, is actively promoting «digital delivery» practices such as e - Ticketing and Digital As - Builts (DABs) [13]. These practices are being implemented at the state level and are gradually becoming mandatory in road construction contracts. Replication of such practices creates industry precedents and increases the requirements for evidence and standardization of digital data on the progress of work.

Table 2 - Key areas for improving legal regulation of digitalization in the investment and construction sector of the USA

| Direction of reform | Key regulatory measures | Implementation tools | Expected effects |
|---|---|---|---|
| Unification of the legal framework | Development of federal standards for digital construction | Joint Initiatives of Congress, ANSI, and NIST | Reduced legal fragmentation, uniform rules across all states |
| Digital data protection | Adapting CCPA and GDPR-like regulations to the construction industry | Cybersecurity Bills , Federal Data Acts | Increasing investor confidence, protecting intellectual property |
| BIM Integration | Introduction of mandatory requirements for BIM in government procurement | AIA Guides, ISO 19650 Standards | Reduced design errors, transparent contracts |
| Using smart contracts | Recognizing the legal force of blockchain contracts | SEC Regulation and Case Law | Automation of calculations, reduction of litigation |
| Cybersecurity | Development of specialized standards for the construction industry | NIST Cybersecurity Framework, Industry guidelines | Protecting project data and digital platforms |
| International harmonization | Convergence with EU and ISO standards | Bilateral Agreements and US Participation in ISO/TC 59/SC 13 | Improving the competitiveness of American companies in the global marketplace |

Based on the analysis of the current legal framework, the following conclusions can be formulated for participants in the US investment and construction sector. Federal and industry standards in the field of digitalization (such as NIST CSF 2.0, NBIMS-US v4, GSA P100 and AIA G- series) form the basis for a shift in the regulatory paradigm. Instead of disparate, voluntary recommendations, these documents, increasingly included in the terms of procurement and contracts, are becoming mandatory requirements. This approach creates a legal platform for the unification of digital processes in construction.

Based on the analysis conducted, it is advisable to develop practical recommendations aimed at increasing the efficiency and transparency of the regulatory framework:

1. Modernization of contract documentation. To minimize risks, it is necessary to adapt standard contracts, including BIM Execution in them Plan (BIM Execution Plan) and clear requirements for the Common Information Environment (CDE). This will ensure legal certainty and distribution of responsibilities between project participants.

2. Increase Cyber Readiness. With the increasing use of digital data, companies should proactively integrate NIST CSF 2.0 requirements into their internal cyber risk management processes to help protect project data and meet federal customer requirements.

3. Development of internal expertise. Market participants are recommended to build up their competencies in the field of working with digital models and their legal significance. This will allow them to prepare for changes in judicial and arbitration practice, which will likely begin to recognize digital models, BIM data and blockchain records as admissible evidence more often.

4. Proactively Adopt Standards. For asset owners and contractors planning to participate in major or federal projects, it is critical to proactively implement the practices and requirements outlined in NBIMS-US v4 and NIST CSF 2.0. This step will not only

**World Bulletin of Management and Law (WBML)**
**Available Online at:** https://www.scholarexpress.net
Volume-50, September-2025
**ISSN: 2749-3601**

improve efficiency, but will also significantly reduce the legal risks associated with non-compliance with new industry regulations.

Digitalization of the US investment and construction sector opens up significant opportunities to improve the efficiency and sustainability of the industry. However, the lack of a unified legal framework, fragmented regulation, and uncertainty in judicial practice are holding back the development of digital technologies. Prospects are associated with the creation of comprehensive legal regulation, institutionalization of BIM, improvement of data protection, and strengthening of cybersecurity. Harmonization of national regulations with international standards will allow the United States to maintain leadership in the global construction industry and ensure sustainable development of the industry in the context of the digital economy.

**LIST OF REFERENCES:**

1. US Bureau of Economic Analysis. Industry Economic Accounts Data. – Washington, DC, 2024. – Mode access: https://www.bea.gov (date accessed: 23.08.2025).
2. Dodge Data & Analytics. The Business Value of BIM for Owners. – SmartMarket Report. – Bedford, MA, 2021. – Mode access: https://www.construction.com/toolkit/reports ( date accessed: 23.08.2025).
3. American Institute of Architects (AIA). Digital Practice Documents. – Washington, DC, 2023. – Mode access: https://www.aia.org/resources/205041-digital-practice-documents (date accessed: 24.08.2025).
4. National Institute of Standards and Technology (NIST). Framework for Improving Critical Infrastructure Cybersecurity. – Gaithersburg: NIST, 2018. – Mode access: https://www.nist.gov/cyberframework (date accessed: 24.08.2025).
5. California Consumer Privacy Act (CCPA), Cal. Civ. Code § 1798.100 (2018). Available at: https://oag.ca.gov/privacy/ccpa (accessed: 24.08.2025).
6. Wylie S. Legal Aspects of BIM in the United States // Journal of Legal Affairs and Dispute Resolution in Engineering and Construction. – 2020. – Vol. 12, No. 3. – P. 1–10.
7. Sacks R., Eastman C., Lee G., Teicholz P. BIM Handbook: A Guide to Building Information Modeling. – 3rd ed. – Hoboken: Wiley, 2018. – 688 p.
8. McKinsey & Company. Cybersecurity in construction: Preparing for digital transformation risks. – 2022. – Mode access: https://www.mckinsey.com (date accessed: 25.08.2025).
9. National Institute of Standards and Technology (NIST). NIST Cybersecurity Framework . – Available at: https://nvlpubs.nist.gov/nistpubs/CSWP/NIST.CSWP.29.pdf (accessed: 26.08.2025).
10. National Institute of Building Sciences (NIBS). National BIM Standard – United States Version 4 (NBIMS-US V4). - Mode access: https://nibs.org/nbims/v4/ (date accessed: 26.08.2025).
11. US General Services Administration. Facilities Standards for the Public Buildings Service (P100). – 2024. – Mode access: https://www.gsa.gov/system/files/P100%202024%20Final%20%281%29.pdf (date accessed: 27.08.2025).
12. American Institute of Architects (AIA). Instructions: G203™–2022, BIM Execution Plan. - Mode access: https://help.aiacontracts.com/hc/en-us/articles/7356618493075-Instructions-G203-2022-BIM-Execution-Plan (date accessed: 28.08.2025).
13. Federal Highway Administration (FHWA). e-Ticketing and Digital As- Builts (EDC). - Mode access: https://www.fhwa.dot.gov/innovation/everydaycounts/edc_6/eticketing.cfm (date accessed:30.08.2025).