



Building the Future: Tech Trends and Related Legal Issues in Construction

Digitization of Real Estate and Construction Projects is inevitable.

As technology continues to advance, the demand for more efficient, transparent, and accessible processes in real estate and construction transactions and management grows. Digitization of real estate, or the use of digital technology in planning, developing, constructing, selling or acquiring, and managing real estate brings numerous benefits to the industry.

Digital tools and platforms streamline operations, reduce paperwork, and enhance communication between stakeholders. They also provide valuable data insights that can inform decision-making and improve overall efficiency. Embracing digitization is essential for staying competitive, meeting customer expectations, and adapting to the evolving landscape of the real estate market.

In this first article of our digitization of real estate and construction series, we will discuss some of the key technology trends and the common issues associated with their adoption. Our succeeding articles will take a closer look at the digitization of documentation, the impact of the internet of things on the real estate and construction industries, the tools for efficient construction and advancing sustainability with the digitization in construction.


Technology Trends in the Construction Industry and Common Legal Issues

The construction industry is undergoing a significant transformation driven by the adoption of advanced technologies. These innovations are reshaping the way construction projects are planned, executed, and managed, leading to improved efficiency, safety, and sustainability. However, the integration of these technologies also brings about various legal challenges that need to be addressed. In this article, we will explore some of the key technology trends in the construction industry and the common legal issues associated with their adoption.



Technology Trends in the Construction Industry

- **Drones:** The use of drones in the construction industry has become increasingly prevalent. Drones are utilized for aerial views, surveying, mapping, traffic study analysis, and site inspection. For example, Skanska, one of the world's largest project development and construction companies, uses drones for site inspections, surveying, and progress tracking. This technology ensures safety and efficiency while reducing travel costs for clients. To ensure safety, Bechtel Corporation, a well-respected engineering, construction, and project management company, uses drones for safety inspections and to monitor adherence to safety protocols. In addition, several US clients of our Firm have been using drones to conduct diligence of land prior to construction, including relating to traffic study analysis.
- **Augmented Reality (AR) and Virtual Reality (VR):** AR and VR technologies are being used for design visualization, training, and virtual walkthroughs of construction projects. AR can overlay digital information onto the real world, helping buyers visualize how their property would look with different paint, textures, decors, furniture or renovations. VR, on the other hand, can be used for virtual tours of properties. In fact, Gray Construction uses AR and VR to provide virtual tours of buildings before they are constructed. Some retail companies are incorporating both AR and VR into their real estate portfolios by building "retailtainment" centers that combine retail and entertainment with these immersive technologies (e.g., Wonderverso by Sony, The Avengers S.T.A.T.I.O.N., STORY at Macy's, etc.).
- **Prefabrication and modular construction:** Prefabrication and modular construction are reshaping the construction industry by shifting much of the building process from traditional on-site projects to off-site, factory-based methods. This approach not only streamlines the construction process but also significantly reduces waste and improves efficiency. Prefabricated components are manufactured in a controlled environment, ensuring consistent quality and precision, and then transported to the construction site for assembly. This method has seen a resurgence of interest due to advancements in technology and a growing demand for cost-effective, rapid construction solutions. Embracing this prefabrication trend, California builder Mighty Buildings uses innovative 3D printing, robotics, and automation to build customizable home kits with 99% less waste having a lower carbon footprint than traditional home construction. The use of their pre-built, factory-made 3D printed panels also cuts construction times by more than half.
- **Building Information Modeling (BIM):** BIM is a digital representation of the physical and functional characteristics of a facility. It provides a collaborative platform for architects, engineers, and construction professionals to work together, improving project outcomes and reducing errors. BIM facilitates better decision-making throughout the building's lifecycle, from conception to completion, by providing a platform for information sharing and collaboration. This results in fewer change orders, reduced field coordination problems, and a more streamlined workflow, leading to more efficient project delivery and management. BIM's impact extends beyond construction, as the data accumulated is actionable and can be used for the operation and maintenance of buildings, aiding property managers and owners in making informed decisions.




BIM is becoming a standard practice in the industry. The German construction company Hochtief, one of the largest construction companies in the world, is actively using BIM technology. In fact, one of its subsidiaries, Hochtief ViCon, develops and applies its own BIM 3D models and provides advisory, management and training services related to BIM. For example, Hochtief ViCon has created a 3D model and provided BIM services in connection with the construction of the famous landmark building “Elbphilharmonie” (philharmonic orchestra) in the City of Hamburg in order to ensure that conflicts between the various contractors were eliminated and collision-free planning was ensured before the commencement of the actual construction works.

- **Internet of Things (IoT):** IoT devices are being integrated into construction sites to monitor equipment, track materials, and ensure worker safety. These devices collect real-time data that can be analyzed to optimize construction processes and improve decision-making. Skanska is integrating IoT into its operations to improve safety and efficiency. For example, it uses smart helmets, wearable sensors, and connected machinery to monitor worker health, site conditions, and equipment performance.
- **Digital Documentation:** Digital signatures and the digitalization of permits are revolutionizing the construction industry by streamlining processes and enhancing security. Digital signatures provide a secure and efficient way to authenticate documents, ensuring that they are tamper-proof and legally binding. This technology eliminates the need for physical signatures, reducing the time and cost associated with document handling. Meanwhile, the digitalization of permits allows for faster processing and approval, as applications can be submitted and reviewed online. This not only speeds up project timelines but also improves transparency and accountability in the permitting process. DocuSign is a company that provides services and platforms for digital documentation and signatures. With respect to the construction industry, DocuSign assists construction companies in building digital agreement workflows, finalizing bids, gathering approvals, and untangling the web of contracts, forms, and licenses involved in launching and completing a project. There are over 8,000 construction companies using DocuSign.



Common Legal Issues Associated with Technology Adoption

- **Data Privacy and Security:** The use of drones, IoT devices, and other digital technologies in construction generates vast amounts of data. Ensuring the privacy and security of this data is a significant legal concern. Companies must comply with data protection regulations and implement robust cybersecurity measures to safeguard sensitive information.
- **Intellectual Property (IP) Rights:** The development and use of innovative technologies in construction often involve IP rights. Companies need to protect their proprietary technologies and ensure that they do not infringe on the IP rights of others. This requires careful management of patents, trademarks, and copyrights.
- **Confidentiality of information:** With the adoption of digital tools and platforms, sensitive data such as project plans, financial records, and client information are now stored and transmitted electronically. This shift has introduced new risks related to data breaches and unauthorized access, requiring robust cybersecurity measures to protect confidential information. Companies must ensure compliance with data protection regulations and implement strong encryption methods to safeguard data. Additionally, internal policies and due diligence processes must be developed to address potential vulnerabilities and ensure that all stakeholders are aware of their responsibilities in maintaining data confidentiality.
- **Contractual Issues:** The integration of new technologies into construction projects can lead to complex contractual arrangements. Contracts must clearly define the roles, responsibilities and performance expectations of all parties involved, address potential risks, and outline procedures for dispute resolution. This is particularly important when using technologies like BIM, which require collaboration among multiple stakeholders.

- 
- **Liability and Risk Management:** The use of new technologies can introduce new risks and liabilities. For example, if a drone malfunctions and causes damage, determining liability can be challenging. Use of Artificial Intelligence tools may also cause errors and omissions. Companies must have appropriate insurance coverage and risk management strategies in place to determine liability and mitigate potential legal issues.
 - **Regulatory Compliance:** The adoption of advanced technologies in construction must comply with various regulations and standards. This includes building codes, safety regulations, and environmental laws. Companies need to stay updated on regulatory changes and ensure that their projects meet all legal requirements.



Conclusion

The construction industry is embracing technological advancements that promise to enhance efficiency, safety, and sustainability. However, the adoption of these technologies also brings various legal challenges and risks that need to be carefully managed and mitigated. Companies can only fully leverage the benefits of technology in construction if they successfully navigate the legal landscape using legal experts who have the extensive experience in this area.



Authors

Global



Juan Bernardo García

Partner



+52 81 8399 1344



juan.garcia-garza
@bakermckenzie.com

Global/NA



Anastasia Herasimovich

Partner



+1 312 861 3732



anastasia.herasimovich
@bakermckenzie.com

LATAM



Alejandra Bugna

Partner



+54 11 4310 2295



alejandra.bugna
@bakermckenzie.com

APAC



Alex Gong

Partner



+86 21 6105 8516



alexander.gong
@bakermckenziefenxun.com

Lead Knowledge Lawyer



Abigail Co

Lead Knowledge Lawyer



+63 2 8558 9423



abigailnerizza.co
@bakermckenzie.com

EMEA



Rita Marchetti

Partner



+39 02 7623 1335



rita.marchetti
@bakermckenzie.com



Weronika Guerquin

Partner



+48 2 2445 3326



weronika.guerquin
@bakermckenzie.com



Daniel Bork

Partner



+49 211 3111 6184



daniel.bork
@bakermckenzie.com