

# 2024 CONSTRUCTION TECH TRENDS TO WATCH

In 2023, technology continued to affect how we conceptualize, design, and build structures. As we step into 2024, it's crucial to anticipate how the acceleration of these trends will shape our industry. This report outlines the key areas where technology is not just supplementing, but revolutionizing, the construction sector, promising enhancements to productivity, safety, and sustainability.

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# INTRODUCTION

In 2023, advancements in construction technology continued to affect how we conceptualize, design, and build structures. As we step into 2024, it's crucial to anticipate how the acceleration of these trends will shape our industry. This report outlines the key areas where technology is not just supplementing, but revolutionizing, the construction sector, promising enhancements to productivity, safety, and sustainability.

This report is a joint publication of Trunk Tools, Inc and The Global Leaders in Construction management (GLCM). GLCM ([www.GLCM.info](http://www.GLCM.info)) is a Strategic Management Research Initiative founded at Columbia University in 2011 by Professor Ibrahim Odeh. The GLCM Group works with Engineering and Construction companies on studying digital, technological, and innovative market trends that are impacting the way the Industry approaches readiness for a fourth industrial revolution. Key topics the GLCM Group is focusing on are: Digital and Innovation Transformation Strategies; the Digital Landscape of the Engineering, Construction, and Infrastructure Industry (ConTech & InfraTech); and the creation of a City Adaptability Index.

Trunk Tools is your firm's partner for Field-First A.I. Construction Technology. Know Everything, with TrunkText, and Build Anything, with TrunkPerform.





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# TREND #1: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

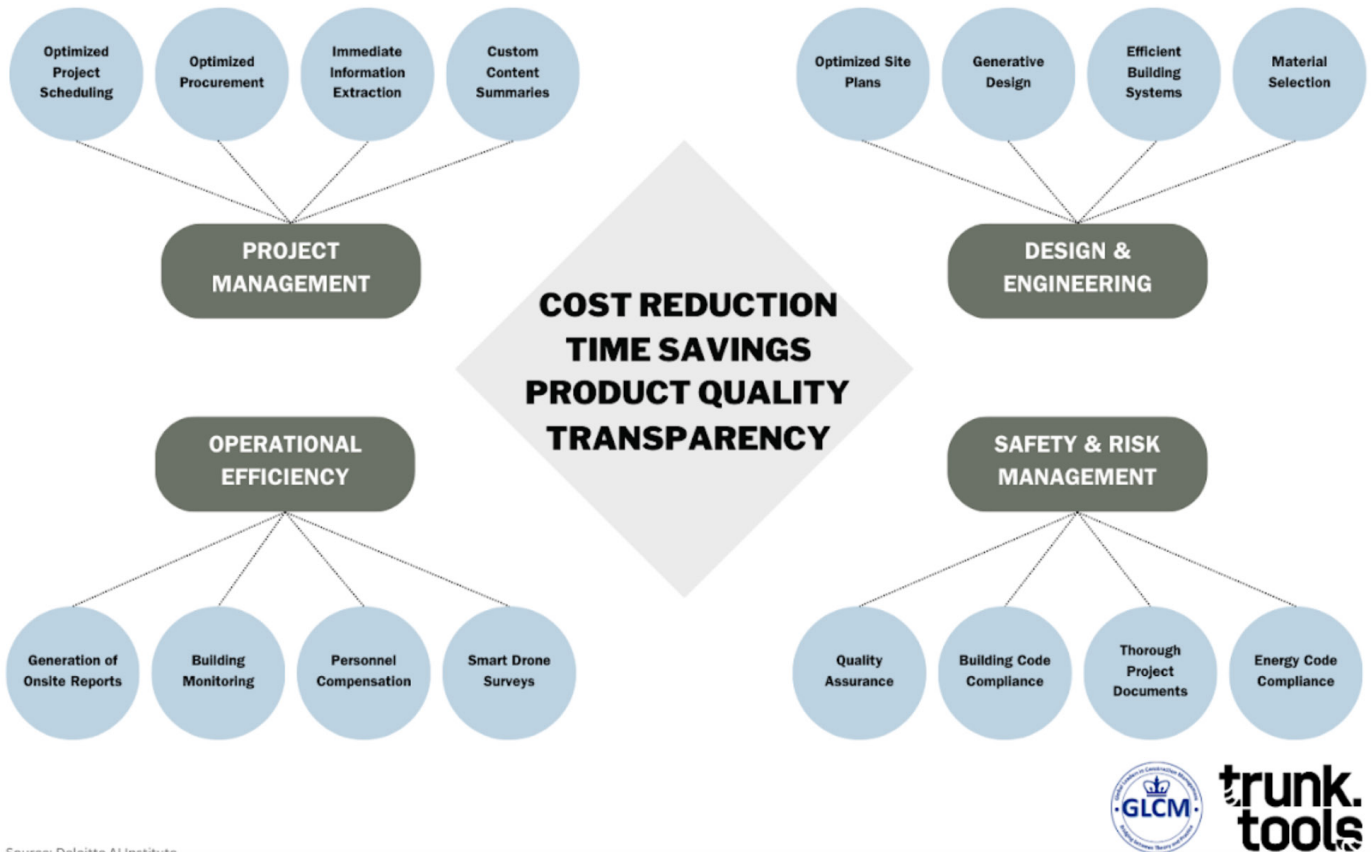
Artificial Intelligence (AI) and machine learning (ML) are already beginning to deliver concrete value to construction firms. Alongside the increased importance of leveraging data, AI and ML can provide key data insights automatically. In a recent Digital Builder podcast episode, industry experts discussed the multitude of cases and real-world examples of artificial intelligence and machine learning in construction today, spanning all phases of project sourcing, planning, management, and completion.

We see several use cases for AI applications specific to the construction industry cited in Deloitte's 2024 Engineering and Construction Industry Outlook, all of which pose huge opportunities for value generation.

The diagram on the next page breaks down just a handful of the areas we're expecting massive gains in productivity through AI.



# AI APPLICATIONS ENGINEERING & CONSTRUCTION INDUSTRY



As we face a skilled labor shortage, with much of our experienced workforce of retirement age, we see today's personnel demanding modern tools to keep pace. ENR suggests this tool is a mobile device, noting the benefits of real-time problem signaling and the ability to capture high-quality data. A study by Panasonic claims 80% of workers note improved efficiency as the primary benefit of mobile devices, followed by greater connectivity (48%), real-time information (40%), and data capture (32%). Unlike past generations, these studies show today's workforce is not only open to technology but actively utilizing mobile devices to increase their productivity and performance.

Furthermore, many startups and established companies have launched compelling AI products supporting contractors, project managers, and frontline employees. ALICE Technologies recently launched Core, an AI-powered scheduling and tracking platform allowing schedulers to optimize their jobsite management and workflows. Other established software providers have launched AI features in their existing product lines, such as the Titan Intelligence line recently deployed by ServiceTitan to turbocharge their field service management offerings.

At Trunk Tools, we take this a step further by leveraging the power of AI in TrunkText, your mobile jobsite wingman. While it's nearly impossible for a human to scan millions of project documents to find an urgent answer, TrunkText will send you the correct answer referencing the relevant document in under a minute. Need to know the paint color of the door on the fifth floor? Got it. Was that HVAC RFI ever answered? Indeed, here you go. Furthermore, as global AI and ML models continue to improve, so do we, increasing the potential impact of TrunkText on your job site.





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## TREND #2: INDUSTRY SUPPORT

Considering the promise of new technologies and the potential for disruption in the AEC industry, we have seen a record amount of investment. A study by McKinsey shows a \$50B investment in the \$12T construction industry from 2020-2022, fueled by rising infrastructure demands, skilled labor shortages, and a need for increased transparency amongst stakeholders.

US Census data also shows construction spending in the US continues to rise. While we did see a decrease in dollars invested in 2023 due to macroeconomic conditions, the number of deals executed increased, showing us there is sustained interest.

We are excited about the intersection of financial backing, infrastructure demand, and availability of advanced technologies to accelerate these trends, all taking place at a critical juncture in construction modernization.



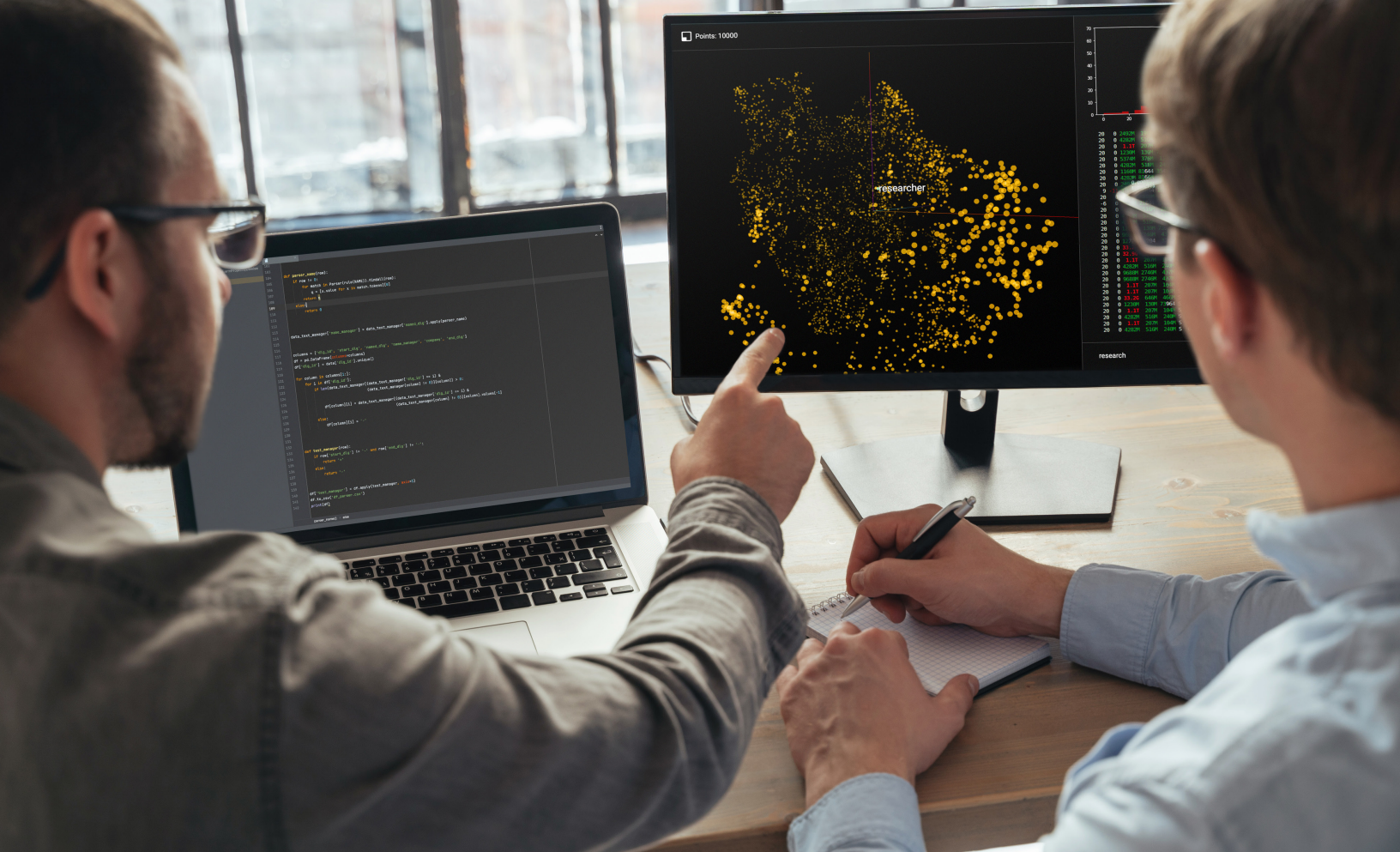


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## TREND #3: DATA SCIENCE IN CONSTRUCTION

The integration of data science in construction has been a game changer. In 2023, we saw an increased reliance on data analysis to optimize project outcomes, resulting in lower construction costs, better scheduling, and improved field safety.

Studies also indicate data science is a major lever to improving procurement practices in the construction industry, in the interest of reliability, speed, cost, and environmental impact of materials. As we look towards a decarbonized future and the necessity to comply with changing regulations, we anticipate the companies harnessing data will win.

For example, Top 100 ENR Contractors like CORE Construction are beginning to appoint Chief Data Officers (CDOs) to develop and implement data strategies, a first for many general contractors. Having robust data teams will prove to be a competitive advantage in the industry, driving faster and more reliable decision-making within AEC firms.

As material and labor costs continue to rise, data science offers contractors solutions for agile and strategic response. Looking forward, more sophisticated data models and larger datasets will bolster the ability to accurately predict project timelines, manage resources efficiently, mitigate risks, and provide deeper insights into construction processes.





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## TREND #4: DIGITAL TWIN IN BUILDING INFORMATION MODELING (BIM)

BIM technology has been at the forefront of construction innovation for a while, but digital twin technology will extend its time in the spotlight. Digital twin technology, which creates a dynamic digital replica of physical assets, allows the many stakeholders of a construction project to envision outcomes and collaborate more effectively. Furthermore, simulation of building systems can lead to more environmentally efficient designs and enhanced construction operations.

Research by McKinsey indicates that 70% of company executives are already investigating and investing in digital twin technologies for their businesses. We see this continuing to infiltrate the construction industry given its particular utility in the field. Autodesk's Tandem is just one of the platforms available to synthesize siloed building information and pull ongoing data, benefiting stakeholders throughout the life cycle of a building. Other players like Trimble are providing high-tech solutions to transform BIM models into digital twins, adding value from concept to closeout.

Not only does digital twin technology provide advantages in the preconstruction and construction phases of a building's life cycle, but it shines when it comes to maintenance, monitoring, and renovations. Accurate documentation of a building's as-built conditions can also provide assurances to building owners, especially in the instance of deficiencies or natural disasters, allowing for quick information finding and response.





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## TREND #5: VIRTUAL AND AUGMENTED REALITY

Virtual Reality (VR) and Augmented Reality (AR) have continued to gain traction in the construction industry. These technologies have improved design visualization, training, and onsite work.

CoConstruct, a developer of construction management software, allows users to view 360 photos using a VR headset. We've also seen companies like Yulio create powerful tools for stakeholders to visualize what a building will ultimately look and feel like, leading to faster decision-making and aligned stakeholder expectations. OpenSpace has recently deployed a streamlined jobsite modeling solution allowing comprehensive digital reality capture of jobsites via portable cameras, with immediate access to the HD scans on-site.

In the field, we've seen companies like PIXO leveraging VR to revolutionize skills and safety training for onsite personnel, leading to reduced injuries, higher quality work, lower employee churn, and improved OSHA compliance.

We are also excited about Sitelink, which harnesses AR and reality capture to streamline issue resolution in the field. Users can overlay and mark up information to quickly communicate onsite issues, create punch lists, coordinate work, and provide quality checks.

In 2024, we anticipate further integration of VR and AR in daily construction activities, enabling more immersive and interactive experiences for both clients and builders.





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## TREND #6: DRONES AND COMPUTER VISION

One area where drones have revolutionized construction is site surveying and inspection. In 2023, drone usage expanded beyond basic aerial photography to include mapping, 3D modeling, and site security. Companies like Wingtra have developed multi-functional drones that can handle anything from GIS and surveying to job site monitoring, providing increased accuracy and time savings in comparison to traditional methods. Since drones can reach otherwise inaccessible locations, workers are kept safe while performing even more thorough inspections.

AI Engineers, which began as a bridge engineering firm in Connecticut, now uses drone technology in tandem with artificial intelligence to scan bridges and identify defects or safety hazards. We spoke with Michael Giacco, a VP at AI Engineers, who described the benefits as threefold: time savings, cost savings, and quality of inspection. “It can take four months to inspect and document a structure. It now takes four days and provides an incredibly thorough report. We are no longer limited by a hands reach.”

When asked what we can look forward to in the future of drones, Giacco said “Every year, a new and better drone airframe and platform comes out that is more capable of doing our specific task - we see airframes continuing to evolve to meet our market.” This enables an even more powerful tool in the toolbox of engineers and inspectors, translating into value for the client.

Outside of the realm of traditional flying drones, companies like Versatile are deploying sensor platforms in unique and creative ways, like the company’s crane monitoring and analytics device providing operators with vital jobsite performance and safety analytics. As the field of computer vision develops, we expect drones and distributed sensors to deliver greater value on and off job sites.

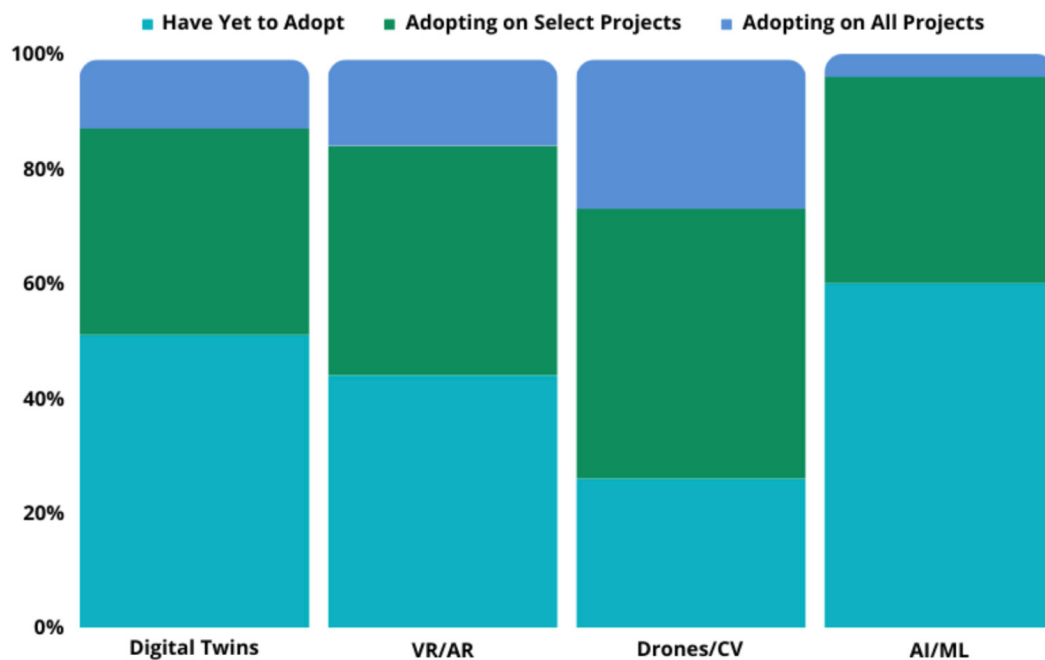


# A LOOK TO THE FUTURE

Considering the many technologies emerging, a recent report from KPMG shows that a substantial level of adoption has occurred for many new technologies. Zooming in on the trends we highlight in the chart below, we see immense growth potential in all four fields, especially in AI.

## Tech Adoption

BY ENGINEERING & CONSTRUCTION FIRMS - JUNE 2023



Source: KPMG 2023 Global Construction Survey



As a pioneering company in the construction technology space, we at Trunk Tools are excited about these advancements and are committed to staying at the forefront of this evolution. 2024 is poised to be a landmark year for construction tech. We look forward to being a leader and partnering with your firm on this transformative journey!





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