



**FIELDWIRE** BY **HILTI**

# AI on the jobsite

Use, impact, and safety in  
the construction industry:

Insights from a global survey of  
176 construction professionals

# Executive summary

Artificial intelligence (AI) is rapidly transforming the construction industry, unlocking new levels of productivity, safety, and operational efficiency across the entire project lifecycle. From generative design and predictive scheduling to automated inspections and intelligent field workflows, AI is reshaping how projects are planned, built, and operated.

This report explores the current and emerging role of AI in construction, highlighting practical use cases already delivering value in preconstruction, active jobsites, and long-term operations. It also introduces a structured framework for successful AI adoption built on intelligent applications, strong data foundations, and responsible implementation.

To better understand how construction professionals view AI today, we conducted a global survey of industry professionals and received 176 responses across multiple trades, roles, and regions. Their insights provide a real-world perspective on current adoption, expected productivity gains, and the barriers teams face when implementing AI on the jobsite.

Alongside the opportunities, AI introduces new challenges around data privacy, system reliability, workforce development, and trust in automated recommendations. Through customer feedback and survey insights, we examine how contractors view AI today, where they see the greatest potential, and where concerns remain.

The findings point to a clear conclusion: while general-purpose AI tools offer incremental benefits, the real transformation will come from AI deeply embedded into construction workflows, particularly on mobile devices in the field. Organizations that invest early in secure, integrated, and responsible AI solutions will be best positioned to improve productivity, reduce risk, and remain competitive in the evolving construction landscape.

# Contents

**Introduction** **4**

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**Reshaping the way we design, build, and deliver** **6**

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**AI on the jobsite: Why, what, and how?** **9**

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**Customer feedback from the field** **12**

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**Conclusion** **16**

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**References** **17**

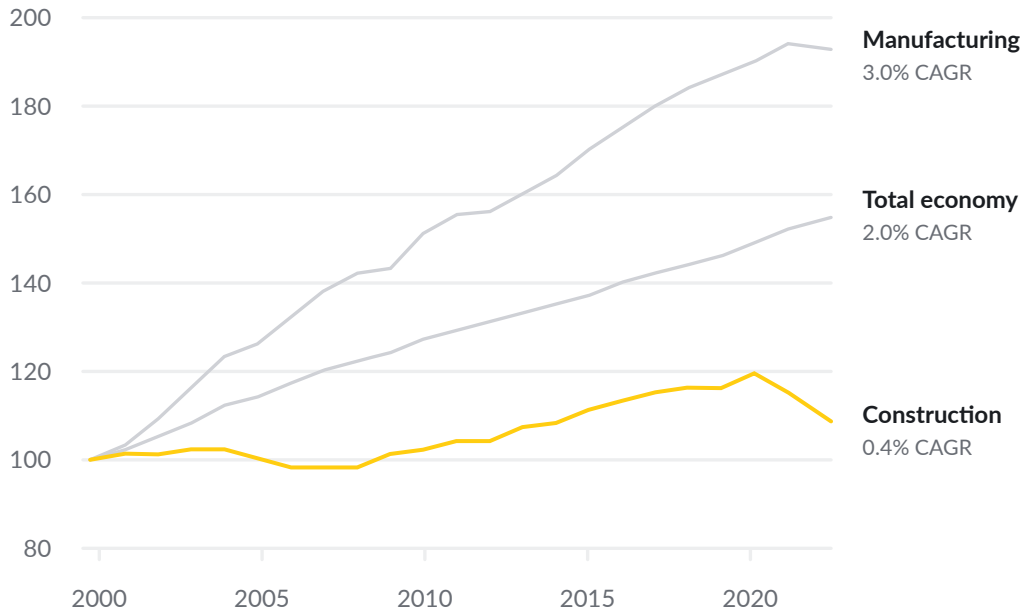
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# Introduction

The construction industry is entering a transformative era. A recent [McKinsey survey](#)<sup>1</sup> highlights that, if current trends of stagnant productivity and slow workforce growth continue, construction output could fall short of global demand by as much as \$40 trillion cumulatively by 2040.

## Labor productivity in construction continues to lag behind productivity in manufacturing and the total economy

Real gross value added per hour worked (global)\*, 2000-22 (index 2000 = 100)



\*Includes 42 countries with sufficient data availability; they account for >90% of the 2022 construction value added.  
Source: McKinsey analysis based on sources from IHS Markit, the International Labour Organization, OECD, the UN, and local statistical offices

McKinsey & Company

For decades, productivity gains have lagged behind those of other sectors, but advances in artificial intelligence are beginning to change that trajectory. It is increasingly clear that AI will play a central role in shaping construction workflows, project processes, and even the physical execution of work through robotics, automation, and intelligent jobsite software.

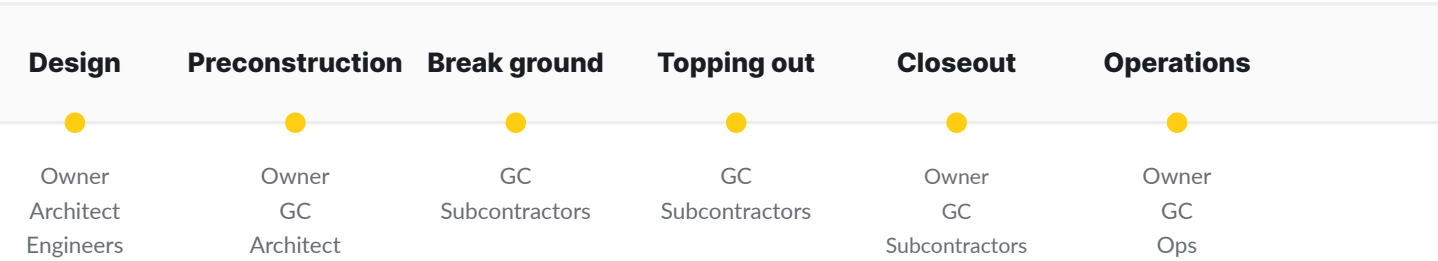
To better understand how the industry views this shift, **we conducted a global survey of construction professionals** and received 176 responses from individuals across a wide range of trades, roles, and company sizes, from field supervisors and project managers to executives and technology leaders. Their input provides valuable perspective on how AI is currently being used, where teams see the greatest potential, and what concerns remain as the technology becomes more integrated into daily construction workflows.

This transformation comes at a critical moment. The rapid growth of data center construction and large-scale infrastructure projects is driving unprecedented demand for skilled labor, even as the industry faces persistent workforce shortages. A January 28, 2026 article in [The Wall Street Journal](#)<sup>2</sup>, citing the Associated Builders and Contractors trade group, reports that the construction sector is currently short approximately 349,000 workers. Compounding this challenge, nearly 41% of the existing workforce is projected to retire by 2031, further widening the labor gap.

In this publication, we explore the early impact of AI on construction management software and jobsite operations. Drawing both from industry research and insights from the **176 survey respondents**, we examine how AI is already improving efficiency, enhancing decision-making, and contributing to safer working environments, while also outlining the emerging challenges that accompany increased technological adoption.

# Reshaping the way we design, build, and deliver

AI is rapidly influencing every phase of the construction project lifecycle, from early design and planning to active construction and long-term operations. Below, we explore some of the most common and impactful use cases shaping the industry today.



## 1 Design & preconstruction

Generative design tools<sup>3</sup> now evaluate millions of potential design permutations based on project goals, site conditions, material constraints, and cost targets. Architects and engineers define key parameters, such as energy efficiency, square footage, or structural load, and AI systems automatically produce optimized design options.

This approach can dramatically accelerate iteration cycles, minimize design errors, and enable more sustainable and cost-effective outcomes, compressing workflows that once took weeks into hours.

In parallel, AI-powered BIM solutions improve constructability by detecting clashes, predicting conflicts, and identifying missing or inconsistent data before construction begins, reducing costly rework downstream.

## 2

## Construction phase

AI adoption during active construction is expanding rapidly across project management, safety monitoring, and quality control.

### Project management

AI in construction project management is increasingly used to support planning and decision-making, though most applications today focus on highlighting risks rather than fully predicting outcomes. By analyzing historical project data alongside inputs like schedules, task progress, and external factors such as weather, AI tools can surface potential delays, flag high-risk activities, and provide early warnings to project teams. These insights help teams make more informed, proactive adjustments, even if final decisions remain human-driven.

Similarly, early-stage resource optimization tools are helping teams better understand workload distribution and identify potential bottlenecks. While not yet fully automated, these systems can suggest more efficient allocation of labor, materials, and equipment based on past performance and current project conditions. In practice, this leads to improved visibility, more balanced workloads, and incremental gains in productivity and cost control rather than fully optimized outcomes.

### Safety monitoring

AI is beginning to enhance jobsite safety<sup>4</sup>, primarily by improving visibility and supporting hazard detection rather than enabling fully automated, real-time prevention. Computer vision tools analyze photos, videos, and camera feeds to identify potential risks like missing personal protective equipment (PPE), unsafe behaviors, or hazardous site conditions. In most cases, these insights are reviewed after capture or through periodic monitoring rather than continuous real-time alerts, helping teams identify patterns and improve safety practices over time.

Drones and site cameras are also widely used to document site conditions and progress, with some platforms applying AI to flag potential safety concerns. However, their primary role today remains documentation and reporting rather than active, real-time intervention.

## **Quality control**

Manual safety documentation has long drained time from what matters most: preventing incidents. When site walks, photos, and paperwork take hours to complete, hazards remain unaddressed and the risk of fines or injuries increases.

AI is transforming both safety and quality control by automating data capture, detecting risks in real time, and generating reports instantly, shifting teams from reactive paperwork to proactive prevention.

At the same time, AI-powered inspection workflows<sup>5</sup> are becoming faster and more accurate, with computer vision systems comparing photos, laser scans, and 3D models against design specifications to identify defects and discrepancies instantly, reducing rework and QA/QC cycle times.

Drones equipped with AI vision further enhance these efforts by efficiently scanning large or hard-to-reach areas for cracks, deformations, and alignment issues, improving safety while lowering inspection costs.

# 3

## **Operations & maintenance**

AI-driven predictive maintenance and digital twin technologies are revolutionizing asset management. By analyzing sensor data<sup>6</sup> from equipment and building systems, AI models forecast maintenance needs before failures occur, which can reduce downtime, extend asset life, and lower costs.

Digital twins<sup>7</sup>, AI-enhanced virtual replicas of physical assets that update in real time using IoT and BIM data, enable continuous monitoring, performance analysis, and scenario simulations. Together, these tools support smarter, data-driven decision-making and long-term operational optimization.

# AI on the jobsite: Why, what, and how?

To unlock the full value of AI, organizations need a clear adoption framework built on three foundational layers: intelligent applications, data foundation, and responsible implementation.



## Intelligent applications:

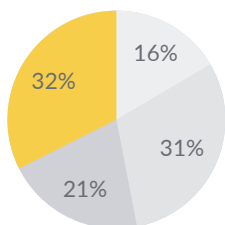
AI-powered tools that automate repetitive tasks, extract insights from photos and documents, and support real-time jobsite decision-making.

The primary goal of AI in the field is simple: keep crews focused on building instead of administrative work. AI-powered assistants and agents optimize rather than replace existing workflows. Voice-enabled tools, automated reporting, and intelligent task creation can significantly reduce time spent searching for information, documenting issues, and managing paperwork.

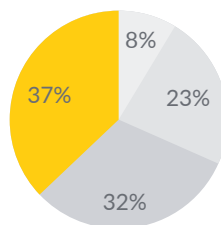
**The result:** More time on productive work, fewer delays, and smoother operations.

### Approximately how much time do you think AI could save you...

...by simplifying the search for project information like plans, specifications, or files?



...by automating repetitive workflows such as creating tasks, completing forms, or similar activities?



Based on 176 survey respondents

# 50%

of respondents believe they could save 3+ hours by reducing search time

# 65%

of respondents see similar savings from reducing redundant tasks



## Data foundation:

High-quality, structured data flows across the project lifecycle, from design through execution, that enable reliable AI insights.

### Smarter document management

AI systems understand document context and automatically organize related content, ensuring teams always access the right information when they need it.

### Intelligent search & answers

AI becomes a practical construction expert in your pocket.

- Instead of relying on basic keyword searches, AI enables natural language queries such as: “What additive is required for today’s concrete pour?”
- Advanced reasoning models go further by providing expert recommendations: “What are the most UV-resistant additives for this application?”

### Enhanced information capture

AI can convert raw jobsite inputs into actionable outputs:

- Voice-to-text for hands-free documentation
- Bullet notes rewritten into professional updates
- Walkthrough transcripts transformed into tasks
- Intelligent metadata suggestions based on visuals and history

## Insights & analysis

AI can also surface trends and predict issues across projects:

- High RFI volumes tied to specific trades
- Recurring safety incidents
- Material delays impacting schedules
- Weather risks affecting productivity

**The bottom line:** AI is not just a tool; it can become a strategic partner for smarter decision-making.



## Responsible implementation:

**Strong data governance, transparency, human oversight, and ethical AI practices that build trust and reduce risk.**

These layers shift construction teams from reactive problem-solving to predictive and prescriptive workflows, making projects safer, faster, and more resilient. With increased reliance on AI comes the need for thoughtful governance.

### Accuracy & safety

Human oversight must remain in place for critical decisions. AI recommendations should support, not replace, professional judgment.

### Data privacy & security

Strict data governance, strict customer scoping<sup>8</sup>, and privacy-preserving techniques such as edge AI<sup>9</sup> can help protect sensitive information.

### System dependence

Organizations should diversify AI vendors, maintain hybrid workflows, and build contingency plans to ensure resilience.

### Workforce development

AI should be paired with training programs that encourage learning and critical thinking, preventing skill erosion among junior staff.

# Customer feedback from the field

## Demand for workflow-integrated AI

A global survey conducted in February 2026 (N=176 construction professionals across trades and roles) revealed that while AI adoption is already widespread, most usage remains limited to general purpose tools such as email drafting and information summaries. Approximately 72% of respondents reported using AI today, but primarily for simple, standalone tasks.

Across the industry, the strongest demand centers on AI capabilities embedded directly into construction workflows, where professionals expect significantly higher time savings and operational efficiency:

**50%**

believe they could save 3+ hours per week through smarter information access

**30%**

estimate that 5+ hours per week could be saved with faster search

**65%**

expect to save 3+ hours per week through automated forms and task creation

Field teams also highlighted the most critical conditions for effective AI on the jobsite. At least **50%** of respondents rate the following as “important” or “very important”:



### **Offline access**

Access documents and features even without reception or Wi-Fi



### **Mobile accessibility via phone or tablet**

Access features and project documents directly from the field



### **Voice input**

Find, create, and update tasks and documentation using voice instead of typing



### **Real-time translation**

Record updates in native language and translate instantly to the project language

**These findings highlight a clear shift:** workers are ready for AI that meets the realities of field execution, not just office-based tasks.

## Insights and cross-project analysis

Contractors also see substantial potential in AI-driven analytics that operate across projects, not just within them. Respondents cited strong interest in capabilities that would:



### Identify recurring bottlenecks and inefficiencies

Spot issues across installations, timelines, and related tasks



### Highlight successful operational patterns

Track progress and identify tasks and workflows that stay on or ahead of schedule



### Strengthen reporting, forecasting, and decision-making

Reduce manual work and improve visibility into performance, risks, and outcomes

About **60%** of respondents agreed that AI-enabled insights would materially improve productivity and overall project performance. This signals robust demand for systems that integrate and interpret data at scale, surfacing patterns that humans alone cannot easily detect.

## Trust, accuracy, and data privacy

While interest in AI is strong, respondents consistently emphasized the importance of trust, transparency, and user control. When evaluating AI autonomy, 38% reported discomfort with AI handling sensitive data, 32% expressed comfort, and the remainder indicated conditional trust based on the specific workflow and data involved.

Across the board, customers showed a clear preference for human-oversight AI over fully autonomous systems. When asked which interaction model they favored:

**29%**

**preferred AI that assists by providing information or accelerating searches**

**32%**

**preferred AI that suggests actions while leaving final decisions to the user**

**18%**

**preferred AI that recommends workflows and highlights issues**

**20%**

**supported more advanced automation, such as generating workflows or reports and offering recommendations**

Respondents also highlighted that sensitive processes, including RFIs, submittals, estimating, and automated task creation, require especially high levels of accuracy, data governance, and auditability.

Collectively, these insights point to a strong need for AI solutions that combine meaningful automation with robust safeguards, earning user trust through reliability, explainability, and user-directed control.

# Conclusion

Artificial intelligence is no longer a future concept in construction, it is already reshaping how projects are designed, built, and operated. From predictive scheduling and automated inspections to intelligent field workflows and cross-project insights, AI has demonstrated clear potential to improve productivity, safety, and decision-making across the industry.

Customer feedback reinforces this trajectory. While general-purpose AI tools provide modest efficiency gains, contractors overwhelmingly see the greatest value in AI that is deeply embedded into jobsite workflows, particularly using mobile devices on jobsites where real work happens. Automation of repetitive tasks, instant access to project information, and data-driven insights are expected to save several hours per week for field teams and leadership alike.

At the same time, concerns around accuracy, system reliability, and data privacy remain significant. The path forward is not blind automation, but responsible implementation, combining powerful AI capabilities with strong governance, human oversight, and transparent data practices.

## **The organizations that succeed will be those that:**

- Invest in workflow-integrated AI rather than standalone tools
- Build strong data foundations across the project lifecycle
- Prioritize security, trust, and ethical adoption
- Empower their workforce through training and collaboration with AI

AI represents a once-in-a-generation opportunity to close construction's productivity gap. By adopting intelligent, secure, and practical AI solutions today, construction leaders can build safer jobsites, deliver projects faster, and position their organizations for long-term success in an increasingly digital industry.

**The future of construction is intelligent, connected, and field-first.**

**Now is the time to begin that transformation.**

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- 2** [Construction companies see promise in AI agents](#)  
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- 3** [How generative AI is shaping the future of construction design](#)  
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- 5** [AI Workforce: using AI and drones to simplify infrastructure inspections](#)  
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- 6** [What is AI for predictive maintenance](#)  
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- 8** **Strict customer scoping:**  
Carefully controlling which customers have access to data, AI features, or systems, and ensuring each customer can only see and use their own authorized information.
- 9** **Edge AI:**  
Edge AI refers to running artificial intelligence computations locally on hardware devices (“at the edge”) rather than sending data back to centralized cloud servers or distant data centers for processing. Instead of raw data being streamed to the cloud for analysis, AI models are deployed directly on devices such as smartphones, drones, cameras, robots, or on-premises industrial machines. These devices perform inference or learning *locally*, enabling faster, more private, and often more reliable AI decisions.