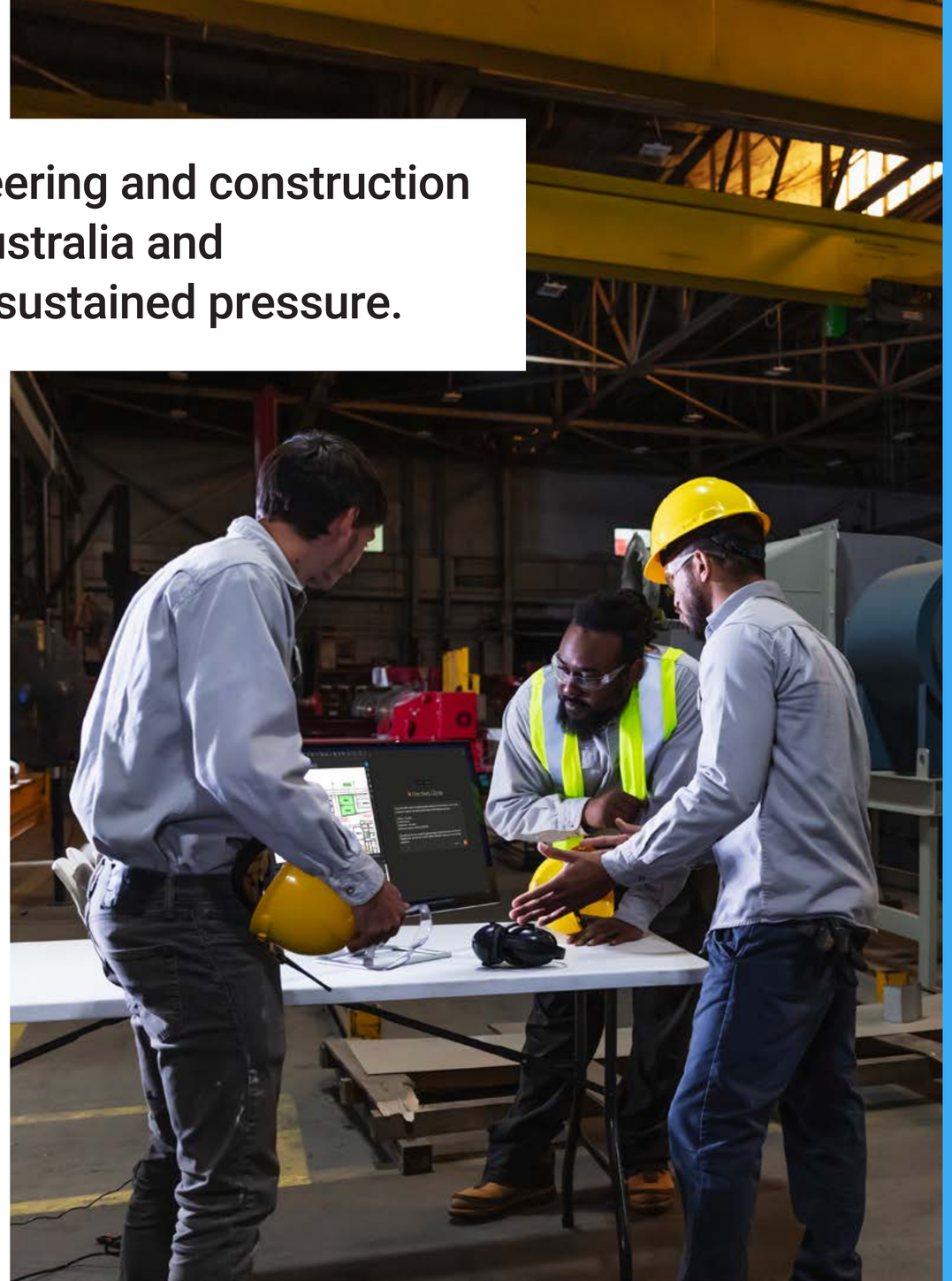
BLUEBEAM
A NEMETSCHEK COMPANY

Practical AI for AEC:

How Bluebeam Max is transforming design, engineering and construction



The architecture, engineering and construction (AEC) sectors across Australia and New Zealand are under sustained pressure.



Engineers in particular are being asked to deliver more complex projects with higher performance and sustainability expectations, safer and quicker, with tighter margins and fragmented delivery models.

These challenges cause outcomes such as congested design schedules, inconsistent documentation, impacted review cycles, late design changes, multiple reworks and breakdowns in co-ordination, bringing an increasing administration and operational burden. Highly trained engineers spend increasing amounts of time on low-value work.

Against this backdrop, AI can be considered experimental and not robust enough for project realities. It's associated not with practical value in terms of making project delivery smoother and simpler but instead

This white paper challenges and disproves that perception.

Rather than a distant promise, in AEC AI is already being applied in practical, targeted ways to reduce manual effort and rework, improve accuracy, boost collaboration and enable better engineering outcomes without displacing professional judgement.

This paper explores how AI, particularly when embedded into familiar tools and workflows, is already transforming design and delivery. With Bluebeam Max as a deep case study, the paper demonstrates that AI is the accelerator of productivity, collaboration and quality as it allows engineers to focus on higher-value work.

Demystifying AI

> AI has the potential, both now and in the future, to minimise and automate the low value-add work, allowing teams to concentrate more on actually building and executing projects.”

Don Jacob
Chief Innovation Officer, Bluebeam

The term AI can be applied broadly. It is often used to describe everything from basic automation to large language models. In sectors that demand precision and accuracy, this lack of clarity can bring hesitation.

However, in practice in the AEC space, AI falls into a small number of well-defined categories. Each has clear, measurable and often powerful benefits in terms of productivity and quality.

Automation:

This involves software that performs repetitive, rules-based tasks that previously involved manual effort. In the engineering design field, this includes the checking of consistency across documents and versions, the addition and extraction of information from drawings and the generation of standard outputs.

Generative reasoning:

Typically, this area of AI is populated by large language models (LLMs), the best known being ChatGPT. The benefits of LLMs is that they allow engineers to deal with complex datasets using their own, natural language, rather than having to learn technological prompts. Therefore, the data can be manipulated conversationally.

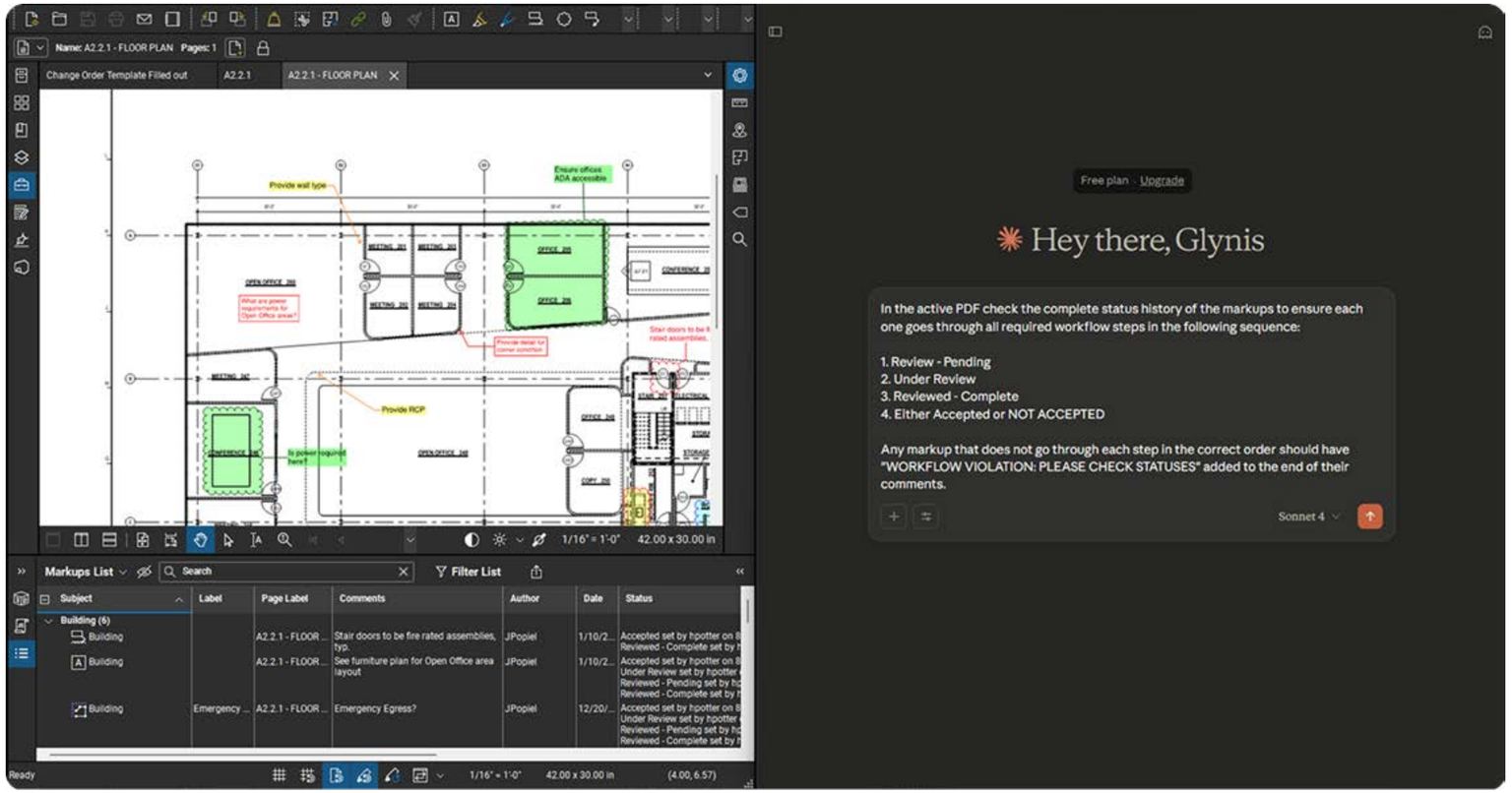
Computer vision:

Software providing a machine vision service can interpret visual information including symbols, schedules, annotations and patterns within drawings, enabling an automated review of sets of drawings at a speed and scale previously unimagined.



Bluebeam's AI evolution

Bluebeam has evolved significantly from a desktop tool for PDF markup into a collaborative productivity tool employed across design, construction and operations.



Collaboration tools such as Studio Sessions in Revu – with cloud and mobile access, integration with other tools and sophisticated data handling – have expanded Bluebeam's role within project workflows.

The next step-change in Bluebeam's evolution has now arrived in the form of Bluebeam Max. Rather than attempting to introduce AI as a new program that must be learned, Bluebeam Max instead places that intelligence directly into the processes that engineers already use.

"Bluebeam Max fills the gap," said Don Jacob, co-founder and Chief Innovation Officer at Bluebeam. "It accelerates the design to build workflows. AI is an enabler. It's the accelerator to getting projects done."

The approach reflects a growing understanding that AI is most effective when it enhances outcomes by removing inefficiencies without forcing a radical change in process.

In the next section, we'll describe these practical applications of AI in the AEC space.

Practical AI in action

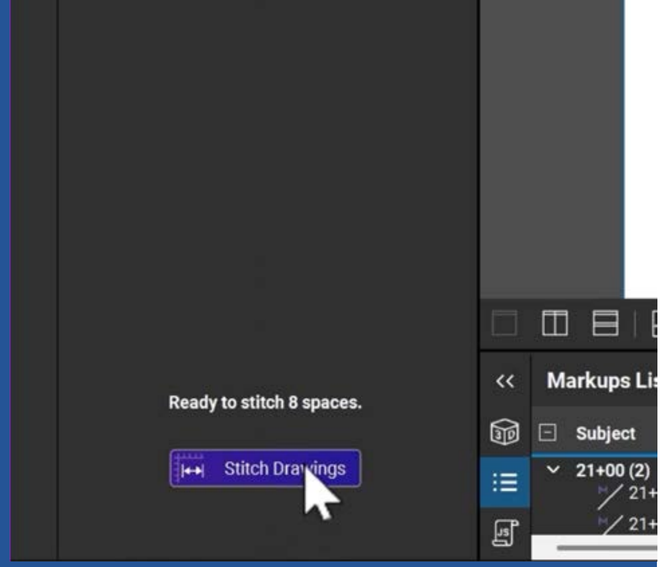
“We’ve all seen the message ‘AI doesn’t build projects; people build projects’. AI is the accelerator.”

Don Jacob
Chief Innovation Officer, Bluebeam

AI’s most compelling case in AEC lies in the mundane, in the day-to-day workflows that rely on accuracy and coordination.

Bluebeam Max collects its AI focus around six core capability areas, each of which addresses common pain points across various project phases.

They are:



Drawing stitching:

Automated stitching of linear and horizontal infrastructure drawings into a single, navigable view.

“Think of roadways, or other horizontal, long civil and infrastructure projects,” Jacob said.

“The roadway is broken up into a series of drawings, then the problem is that people want to see it together. But there’s no easy, efficient way to do that. In fact, it’s typically a very manual process to reassemble the overall site drawing.”

“So, we’re now using computer vision and other techniques to stitch all the documents into one PDF that can be easily updated, or re-stitched, as the project progresses. I can load it into a Studio Session and we can all collaborate on it. It achieves in minutes what once took significantly longer.”

AI drawing review:

Automated quality checks that analyse drawing sets for completeness, consistency and missing elements.

From Bluebeam’s acquisition of Firmus Technologies comes an AI-driven capability that addresses drawing quality.

“Integrated right into Bluebeam Revu is this exceptional technology that can analyse a set of drawings and identify issues within those drawings,” said Luke Prescott, Bluebeam’s Senior Director, Product Management.

“For example, it can reconcile door schedules. Right out of the gate, it can help a user identify, ‘What am I not seeing here that I should be aware of?’, and it puts markups directly on the drawing.”

AI drawing comparison / smart overlay:

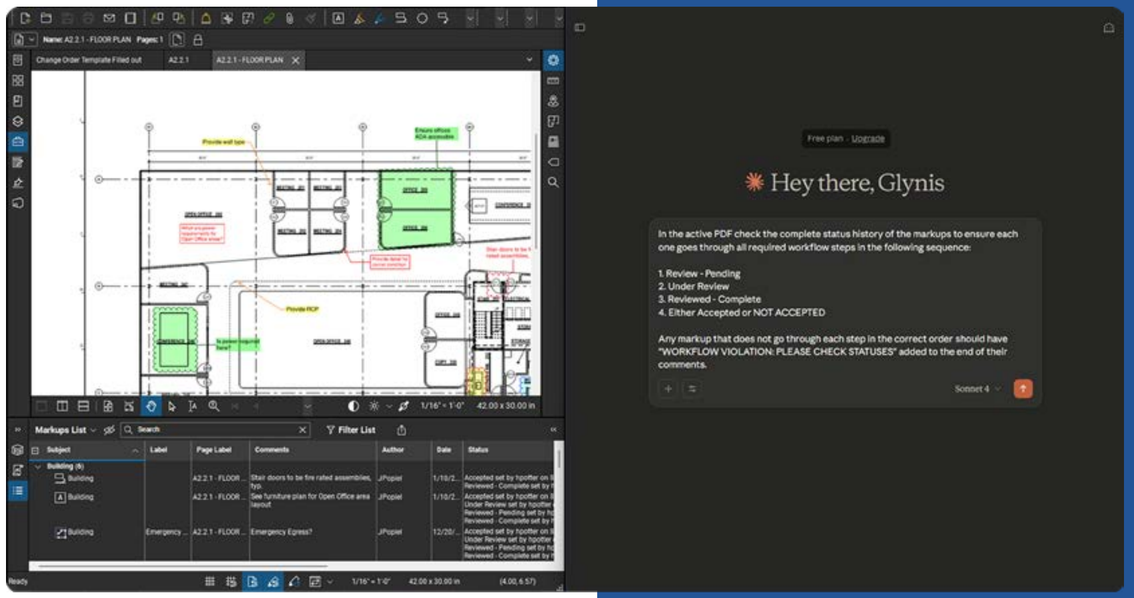
Intelligent comparison of drawing revisions to identify and prioritise changes across large drawing sets.

Firmus' technology has been used to significantly beef up Bluebeam's overlay and compare capability, automating locating differences between drawing sheets.

"I load in my 100-page drawing set, plus one received back from the architect, and it will do a sheet-by-sheet comparison," Jacob said.

"It's showing me, first of all, where the net differences are so I know where I need to focus, and I can zoom down into each change. So, the architect is supposed to indicate where the changes are, but in the past I couldn't guarantee that I'm going to see them all. That's no longer a problem."

Bluebeam Max automates these tasks, freeing up the designer or engineer to focus on higher-value areas.



Simple language interaction via Model Context Protocol:

Bluebeam Revu AI ready, so large language models can interact with drawings, markups and metadata through natural language.

Perhaps the most exciting offering is the ability to interrogate the drawings and data in simple, everyday language.

An engineer can take all of the text from a PDF, including all of the markups, and feed that into Claude, a large language model (LLM) similar to ChatGPT. They can then ask questions of the drawings.

Such questions could be simple, such as asking the address of the project. Or they could be complex, such as requesting a written narrative of all the materials in the bid and in the scope, and a live, real-time dashboard of markup material.

"I asked it to create a calendar view of all the markups that had been placed, including filters by author and by status, and it immediately produced a calendar," Prescott said. "I could see all the markups, who placed them, what they contained and when they were placed and I could filter them. The entire process took 90 seconds. The limit really is someone's imagination."

Connected sessions with Revit:

Portable markups that flow between Bluebeam and Revit, visible in both 2D sheets and 3D models.

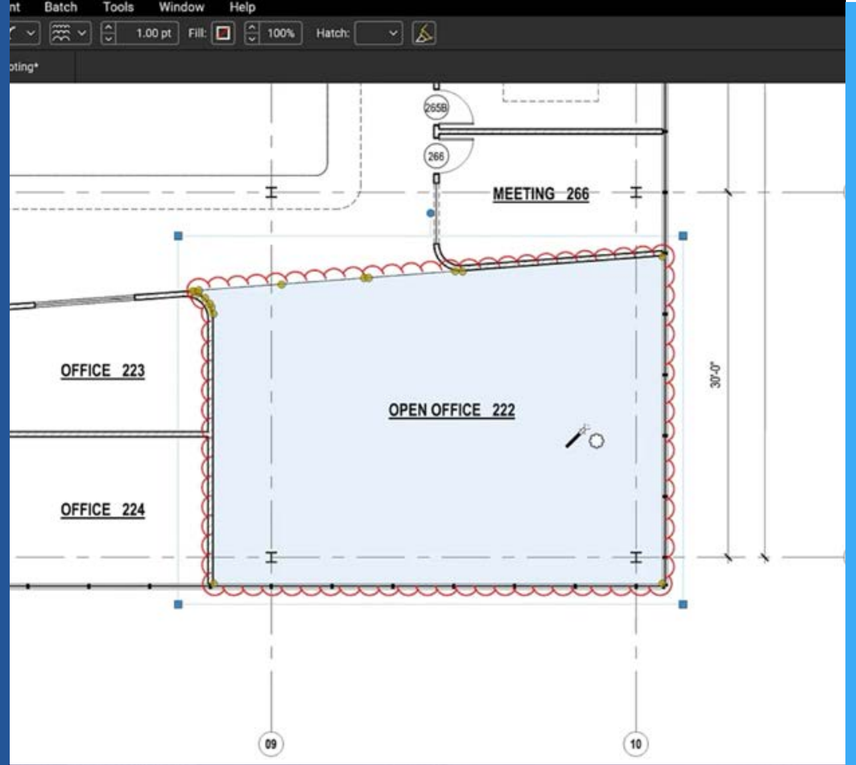
Throughout Bluebeam's existence so far, every markup has been viewed within a Bluebeam application. But now, the code has been cracked to enable markups in third party applications.

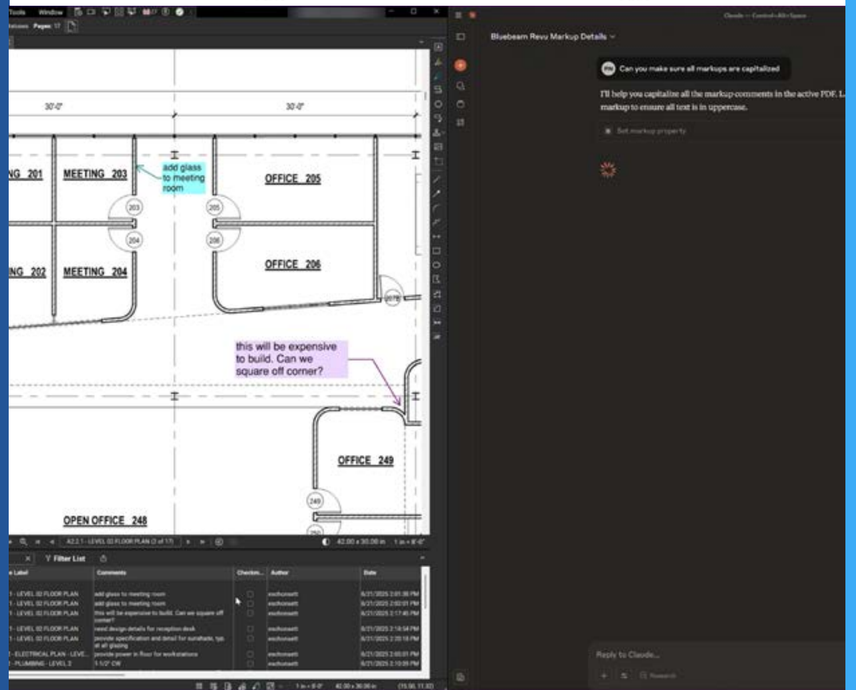
An excellent example is a new integration with Autodesk Revit that enables a Revit user to create a connected session between the 3D model in Revit, the 2D sheets in Revit and the 2D PDFs in Bluebeam's Studio Sessions.

"When I markup a Studio Session, that markup is now also populated in Revit … in 2D or 3D," Prescott said.

As Studio Sessions are supported across the Bluebeam ecosystem of Revu, web, iOS and Android, a designer can put an as-built model into Revit and create a session, then invite their team out in the field to make markups in real time. It's a bidirectional feedback loop where each player remains within their tool of choice and collaboration is enabled seamlessly, in the background.

The outcome will be faster issue identification and resolution, as well as clearer accountability. "That's an absolute game changer," Prescott said.





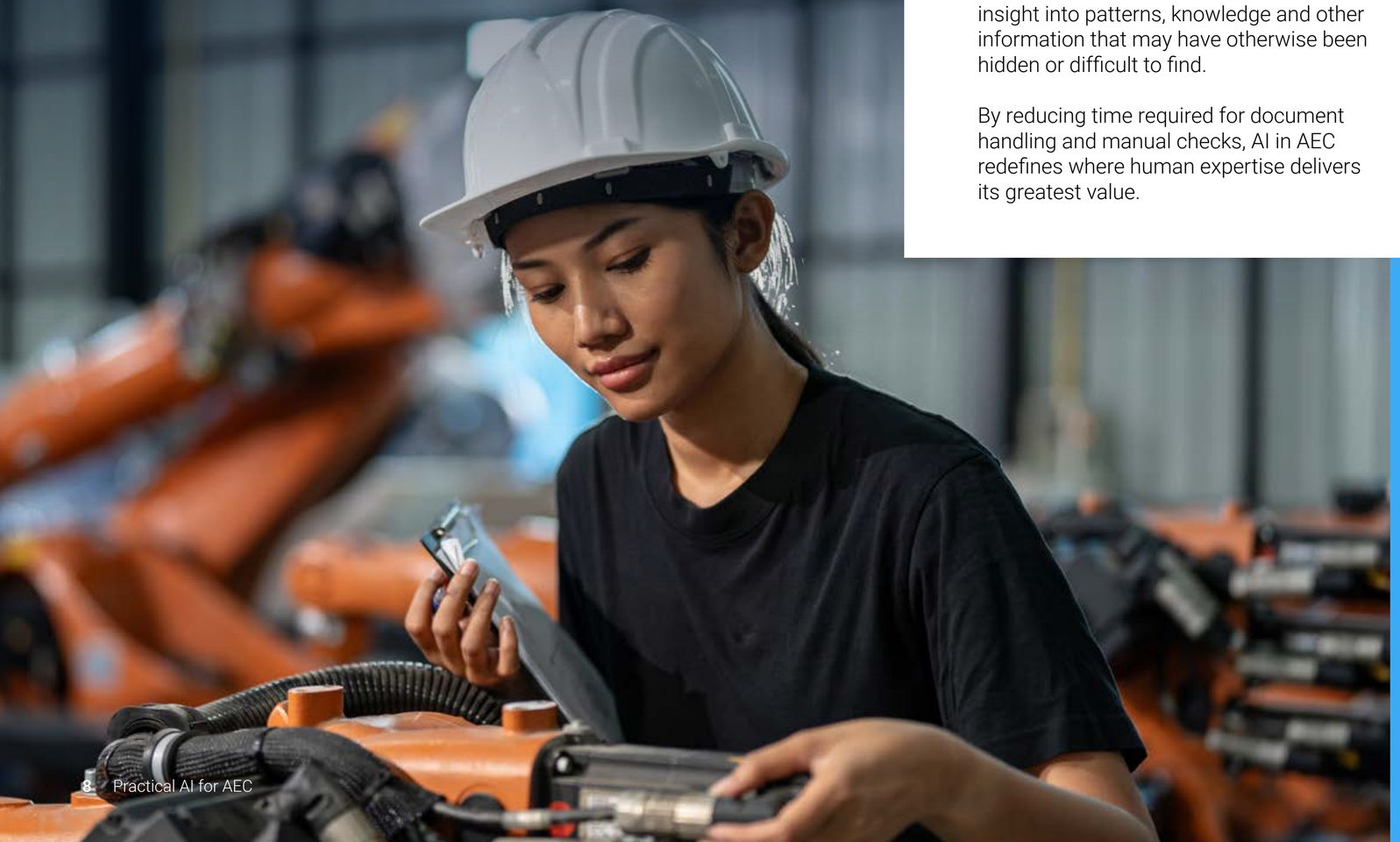
Underlying platform pipeline for ongoing AI expansion:

The capability for Bluebeam and its customers to add new AI capabilities, checks and intelligence over time.

Of course, Bluebeam will continue to add new capabilities. But more exciting is the fact that with the current capabilities, organisations can now design and build their own AI-driven processes.

"Organisations can now build automated workflows using AI in new ways," Prescott said. "They can build standard operating procedures for large teams, and Revu and other Bluebeam tools are now at the centre of that."

Human expertise and experience + AI: The future-proof



The role and importance of human expertise is boosted by the entry of AI technologies into the AEC sectors.

The defining characteristics of the technology are that it automates the repetitive and offers insight into patterns, knowledge and other information that may have otherwise been hidden or difficult to find.

By reducing time required for document handling and manual checks, AI in AEC redefines where human expertise delivers its greatest value.

Engineers can instead focus more deeply on design, risk management, community and stakeholder engagement and innovation. It's these areas and more, as Bluebeam CEO Usman Shuja pointed out at the recent Bluebeam Unbound event, where experience, judgement, communication and creativity matter most.

The future, Shuja said, belongs to professionals who combine domain expertise with tools that boost their capabilities. AI is a multiplier.

Strategically, the shift to AI will offer organisations in AEC competitive advantage. Faster delivery, less rework, improved quality and better use of talent all add up to better financial results, greater engagement and more satisfied stakeholders.

Similarly, individual engineers who develop technological fluency will set themselves up for leadership positions.

Most importantly, AI is not a speculative, experimental or futuristic technology. It exists and its adoption is accelerating. The only question now is how and when to engage.

Where can AI enhance your workflow, today?

Far from being an abstract concept, AI is now embedded in trusted platforms and therefore aligned with real, everyday engineering workflows. It is a practical accelerator of collaboration, quality and productivity.

When it is not delivered as a standalone product, AI-powered technology becomes a flawless, simple and natural extension of the way engineers already work. Bluebeam Max demonstrates the many ways AI can deliver immediate, tangible benefits.

The future of AEC is all about boosting efficiencies. So, how can AI enhance your workflows, today?

Learn more about Bluebeam Max today.

