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Constructing Trust: The Role of Ethical AI in Shaping AEC's Future

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#AGCTECH24

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GIF Credit: Ludimos

Quick Poll: How do you feel about AI?

Optimistic, the best thing ever!

Skeptical about its impact

I like the tech but I am concerned

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$8bn

investment in AI startups and the adoption of cloud-based technologies until 2031[1]

$13.5bn

global market for AI in construction[2]

35% CAGR

Generative AI market size between 2023-2032[2]

GenAI Popularity[3]:

41% in Asia-Pacific

37% in China

35% in Europe

41% in North America

1 How the construction industry is adopting AI, **JLL**, 2023
2 Artificial Intelligence in Construction Market Size, **Adroit Market Research**, 2023
3 GenAI: Spurring a New Era of Construction Tech, **SAP**
4 The state of AI in 2023: Generative AI's breakout year, **McKinsey & Company,** 2023

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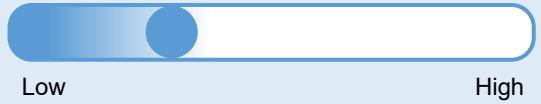
Finance	▪ Fraud detection by analyzing transaction patterns ▪ Algorithmic high-frequency trading by analyzing data for optimal returns	▪ Better fraud detection and enhanced security	
Automotive	▪ Autonomous vehicles and self-driving technology ▪ Intelligent assistant	▪ Reduced traffic accidents and improved safety	
Manufacturing	▪ Smart factories and industry 4.0 technologies ▪ AI-driven quality control and supply chain management	▪ Higher productivity and efficiency	
AEC/O	▪ Generative design tools ▪ Automated quality control and inspection processes	▪ Reduced design time and effort through automation ▪ Improved accuracy through precise automated inspections	

Source: https://adsknews.autodesk.com/en/news/ai-data-usher-in-future-for-aec/

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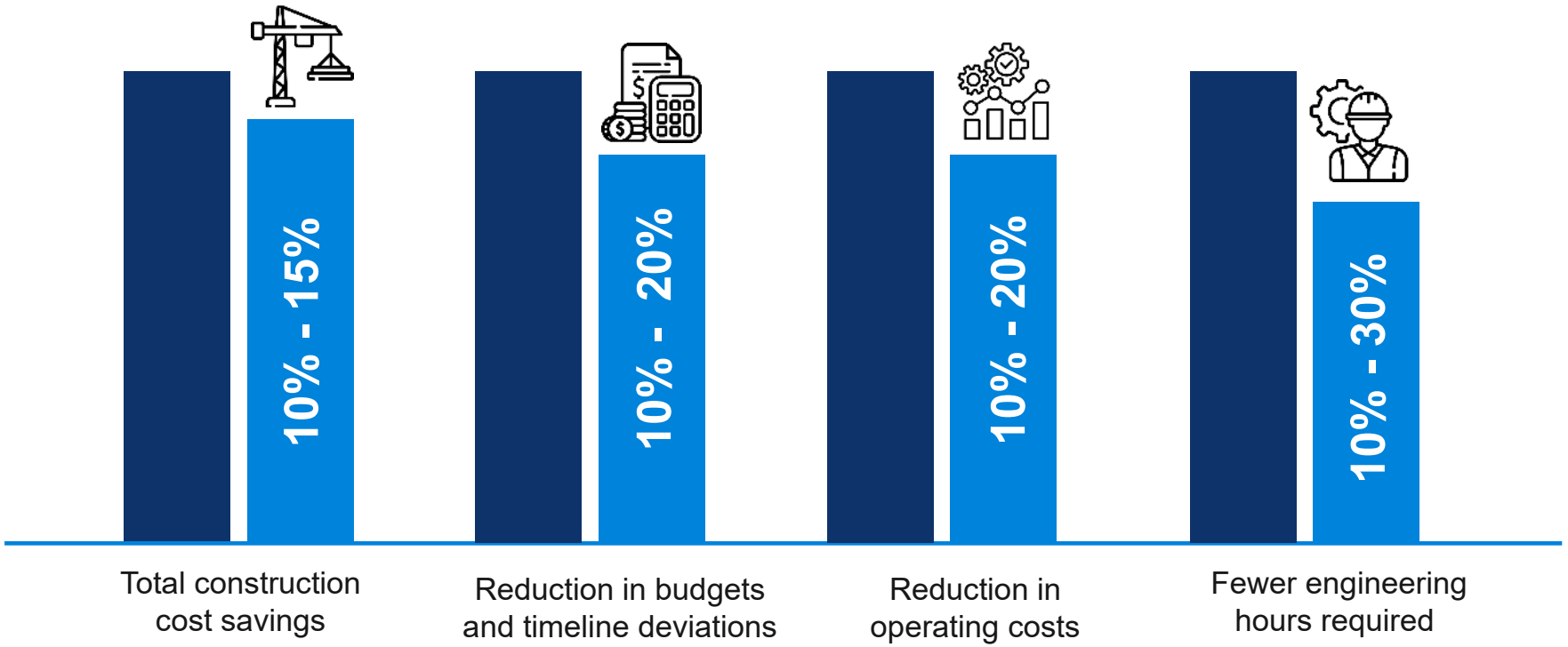
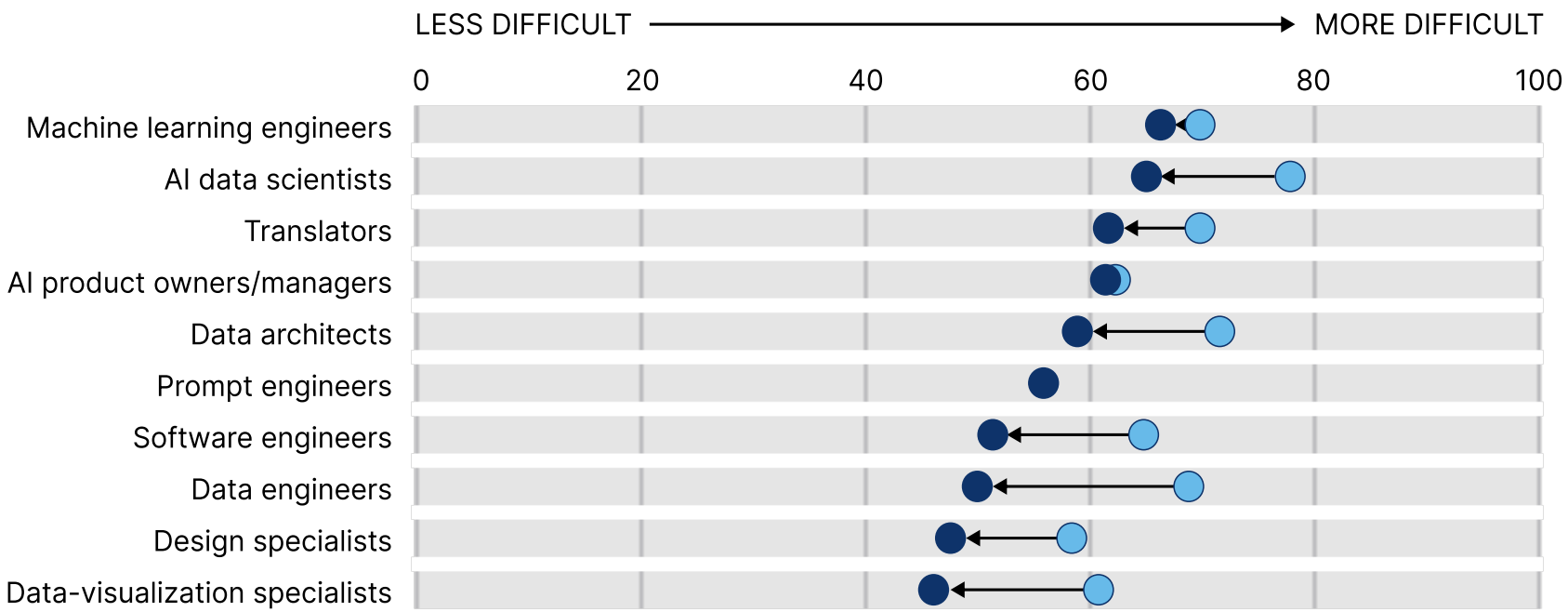
Predicted benefits of AI in the built world



Source: Deloitte: The Age of With… AI in construction and infrastructure

Hiring for AI-related roles remains a challenge, though reported difficulty has decreased since 2022 for many roles.

Share of respondents reporting difficulty in organizations' hiring of AI-related roles, % ● 2022 ● 2023



Source: The state of AI in 2023: Generative AI's breakout year, **McKinsey & Company,** 2023

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ARCHITECTURAL DESIGN	STRUCTURAL ENGINEERING	MEP DESIGN	CONSTRUCTION	OPERATION	DECOMMISSIONING
▪ Automated space planning ▪ Site & environmental impact analysis ▪ Parametric design optimization ▪ Drawing automation ▪ Immersive visualization	▪ BIM structural analysis & load prediction ▪ Optimal material selection ▪ Construction simulation ▪ Lifecycle cost prediction	▪ Automated layout generation ▪ HVAC system optimization ▪ Energy consumption prediction ▪ Sustainability optimization	▪ Construction robotics ▪ Real-time monitoring for project management ▪ Resource allocation optimization ▪ Defect detection & quality control	▪ Predictive maintenance for equipment ▪ Energy management optimization ▪ Security threat detection ▪ Lifecycle tracking of building assets	▪ Deconstruction planning ▪ Lifecycle analysis ▪ Decommissioning cost prediction ▪ Compliance monitoring

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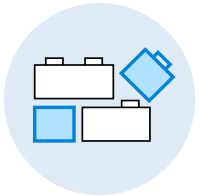
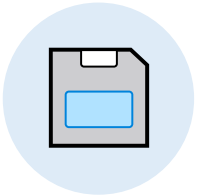
Five tips for AI success

Have a purpose and strategy for AI



Keep things simple and achievable

Outline your strategy and assemble a diverse team



Understand your data needs

Think through change management

Why **Ethics** and **Trust** in AI?

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NYC's AI chatbot was caught telling businesses to break the law

Photo: NBC New York

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Amazon's machine-learning specialists uncovered a big problem: their new recruiting engine did not like women

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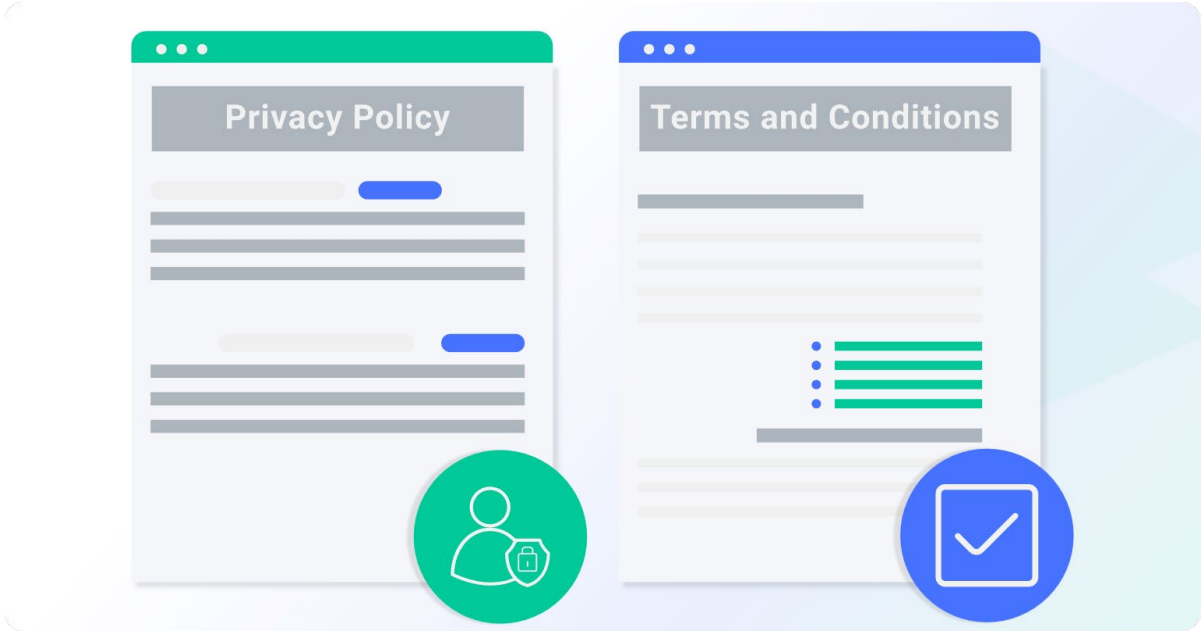

Burden of responsibility is with the user

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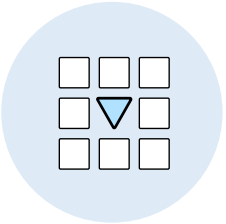
Areas of ethical concern for AI

Bias and discrimination

Privacy and surveillance

Lack of transparency

Accountability and control



Job displacement

Your skills are irreplaceable.

Human Expertise

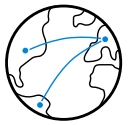
Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence

- Signed by President Biden on October 30, 2023
- Establishes comprehensive framework for ensuring AI technologies are developed and deployed in a manner that's safe, ethical, and aligned with democratic values
- Addresses various aspects of AI governance, focusing on risk management, innovation, public trust, workforce development and international collaboration

How the EO on AI relates to construction

Project management optimization – emphasis on transparency and accountability

Safety protocol enhancements and quality assurance – mandate for rigorous safety standards



Sustainability –supports AI applications for environmental sustainability

Workforce development – focus on enhancing education and training programs

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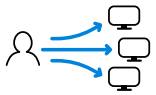
EU requirements for achieving trustworthy AI

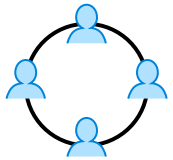


Human agency and oversight

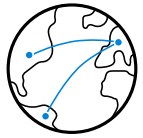
Robustness and safety

Privacy and data governance

Transparency



Diversity, non-discrimination and fairness



Societal and environmental well-being

Accountability

China's national level AI regulation

Content Moderation

Prioritizes traceability and authenticity – aims to foster innovation while ensuring government control

Data Protection

Ensure personal data processing doesn't harm or undermine public order, emphasizes user consent and rights

Transparent Data & Models

Addresses the need to ensure security and transparency, and prevent discrimination, with algorithms and datasets

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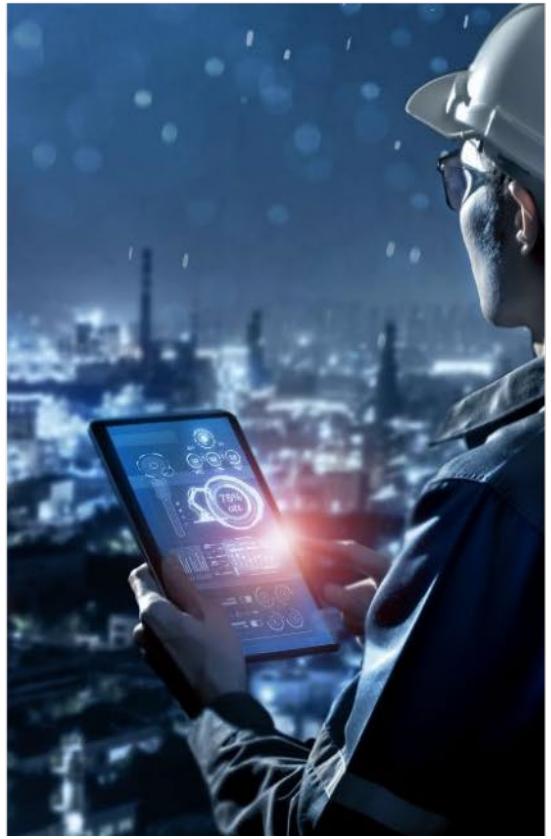
Interoperability

Artificial Intelligence



Digital Twins

Sustainability

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ALLPLAN	BLUEBEAM	CREMSOLUTIONS	dRofus	dTwin™ A NEMETSCHEK SOLUTION
gocanvas	GRAPHISOFT	MAXON	NEVARIS	RISA
	SOLIBRI	SPACEWELL	VECTORWORKS	

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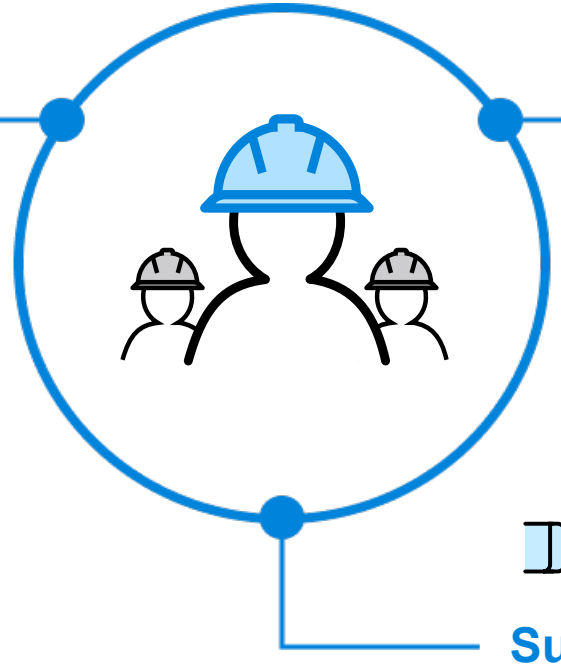
Bluebeam Revu

Our flagship product for document markups, measurements, and real-time project collaboration.



Bluebeam Cloud

Web and mobile product that extends your Revu workflows for collaboration anywhere.

Support & Resources

The help you need to get started faster and keep your projects on track.

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Drawing & Document Management

Manage, organize and share materials from anywhere

Design Review & QA/QC

Reduce defects and optimize review times with digital collaboration

Takeoffs & Estimation

Improve takeoff speed and accuracy to build more winning bids

Site Logistics

Capture site conditions and share detailed logistics plans

RFIs & Submittals

Share across devices to organize and track progress in real time

Punch

Place, assign, track, and close punch items on the go

Project Handover

Store and deliver smart, searchable digital handover packages

Nemetschek's vision on AI deployment

Develop AI in an **ethical and trustworthy** manner, ensuring **transparency, fairness, and accountability** in all AI-driven processes and applications.

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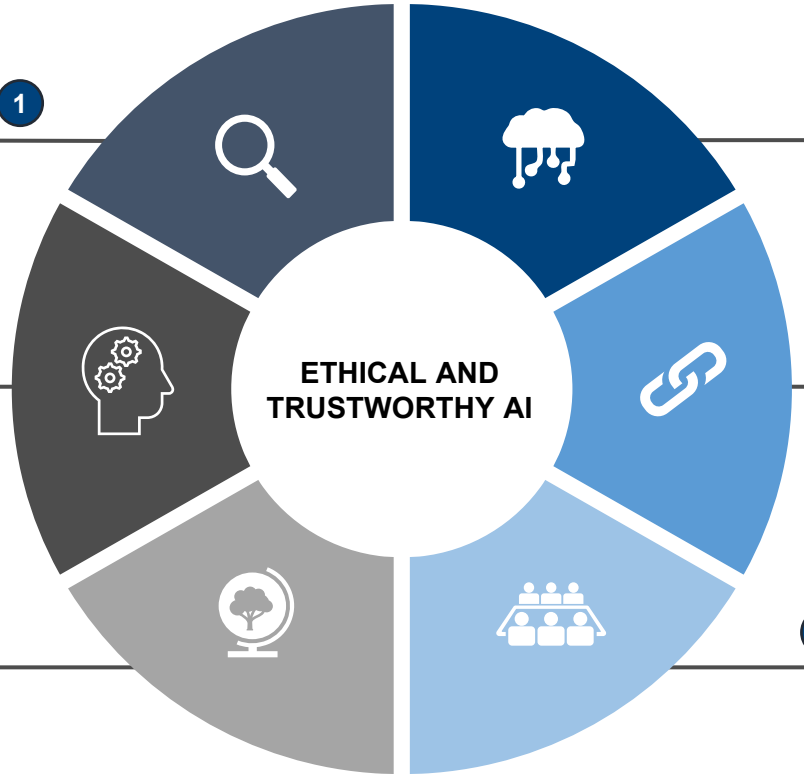
Ethical and trustworthy AI: Six Nemetschek commitments



1 TRANSPARENCY AND EXPLAINABILITY

2 PRIVACY AND DATA SECURITY

3 ROBUSTNESS AND RELIABILITY

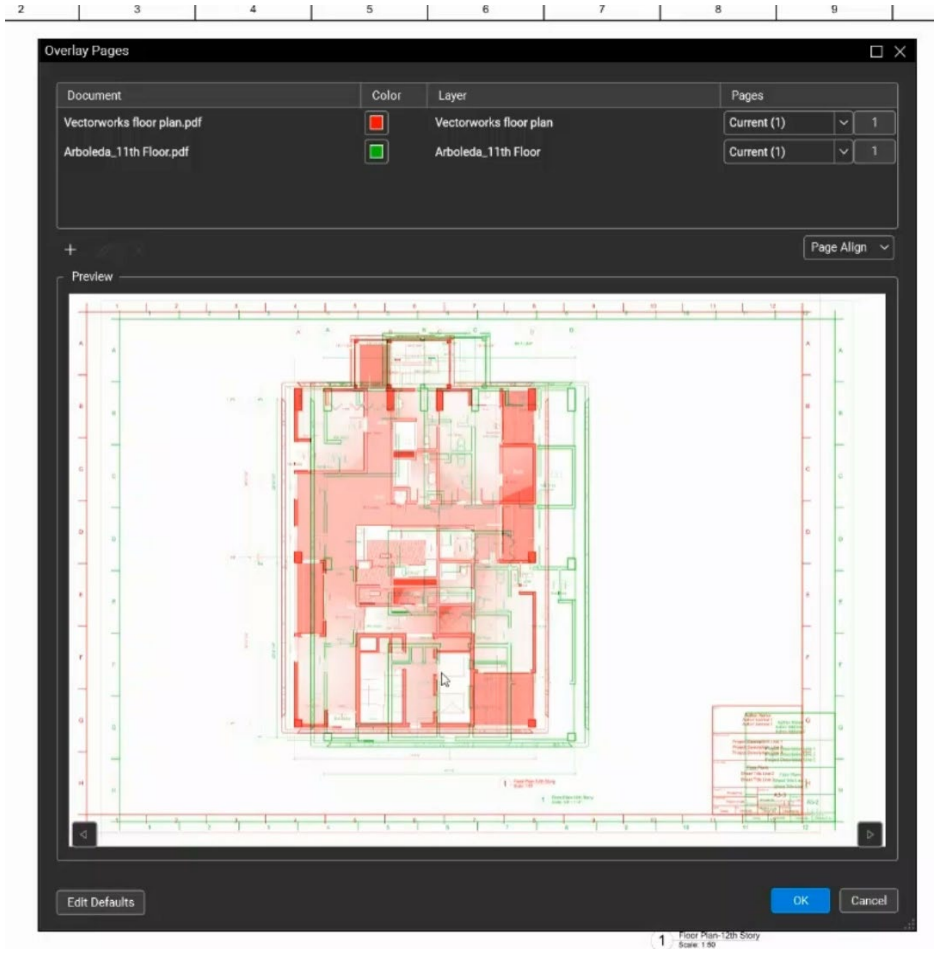
4 ACCOUNTABILITY AND GOVERNANCE

5 SUSTAINABILITY AND SOCIETY

6 STEWARDS OF CHANGE

Overlay drawings

- AI used to align drawings automatically
- See differences between revisions or disciplines
- Understand the differences up to 80% faster



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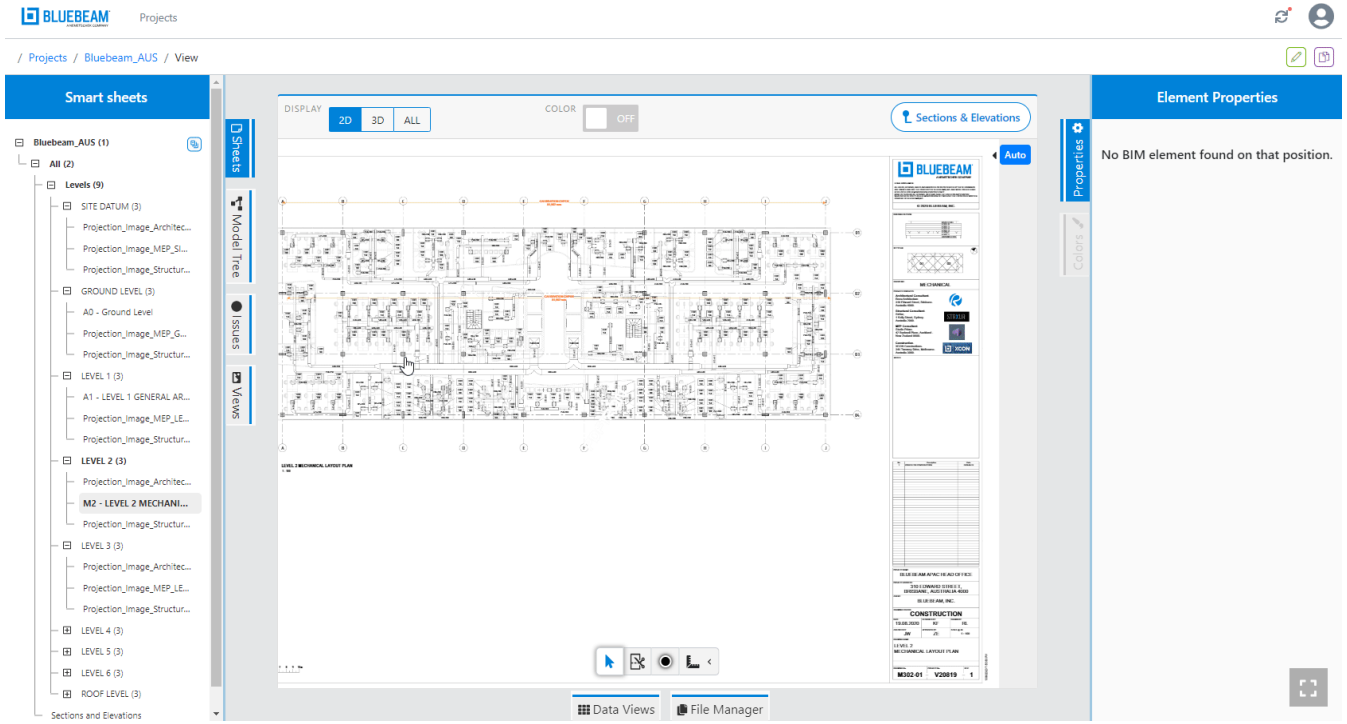
Connect 2D drawings to BIM

- Uses AI to correlate drawings with BIM models
- Navigate BIM data via 2D
- Gives BIM access to the field



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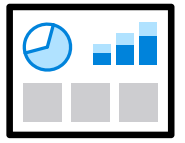
Why consider Ethical AI

Maintain trust and reputation

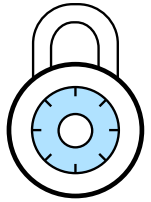
Mitigate legal and regulatory risks

Enhance operational efficiency

Promote inclusive business practices



Meet stakeholder expectations



Future-proof your business

Key Takeaways

- AI is starting to make an impact in AEC and if left unattended could have negative impacts
- Humans thrive in the environment of trust and fairness, and AI should be trustworthy
- Push the responsibility to tech providers to be trustworthy

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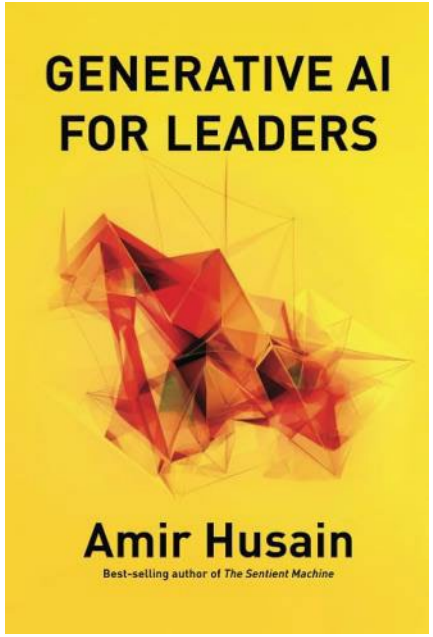
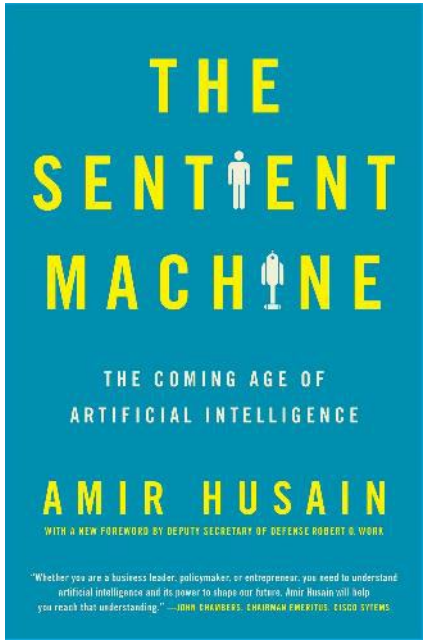
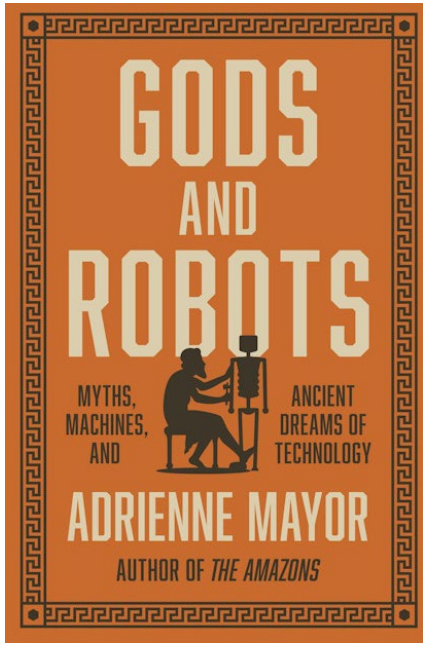
Looking for more?







Questions?