

The Rise of Al in Construction

Evelin Lättemaa Technical Sales Specialist AEC

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Industry Challenges

Major Challenges in the Construction Industry







35%

Source: Construction Disconnected – FMI Report

\$280B

Preventable **cost of rework** if right decisions were made with good data

96%

Source: Construction Disconnected – FMI Report

Source: Big Data = Big Questions for the Engineering and Construction Industry – FMI Report

Earlier decisions have large impacts on project outcomes.



"Simplifying the way we work is critical for our success given the complexity of our clients' projects. Even before we break ground, we need to make sure everyone on the team is working towards a common goal and making decisions quickly and effectively." – ENR Top 50 Design-Build GC

71%

Profit Increase by leveraging AI within next decade





The Industry is Ready for Change

History of AI at Autodesk

Industry leader in every major technology disruption for the past 4 decades Autodesk Research worked on complex Al problems like generative design for **10+ years** The first construction platform to release Alpowered insights 5+ years ago

Today AI is employed across the Autodesk Construction Cloud to automate workflows and features and to predict real-time risk

AI Across Autodesk AEC

Autodesk Design Solutions

- Generative Design
- Automated Analysis
- Design Tool Assistance

Autodesk Construction Solutions

- Assistive Workflows
- Predictive Insights
- Intelligent Search

Autodesk Research

- AI & Machine Learning
- Robotics
- Optimization
- Simulation
- Human and Computer Interaction
- Fundamental Mathematics & Geometry

Autodesk Design Solutions

Generative Design & Al

Conceptual Designs

Automated Analysis

Building Performance Analysis (Energy / Structural)









Examples of Al in Design





Steel + precast concrete



Timber only



Steel + in-situ concrete (two-way spanning slabs)



Steel + in-situ concrete (one-way spanning slabs)



Industrialized Construction &AI-Enabled Housing Design





Real-Time Embodied Carbon Estimation

<u>Carbon (Embodied) **</u>

1,736,323.20 kg CO2 eq



Pro Foi	<u>Pro Forma</u>				
Studio :	0				
1BR :	0				
2BR :	20				
<u>Unit Co</u>	<u>unts</u>				
CR2:	20				

Al in Construction: TODAY

Today: Assistive Workflows



Photo Autotags

Autodesk Build



Details	References		
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Automated Symbol Detection

Autodesk Takeoff



Automated Submittal Log Generation

AutoSpecs



Construction IQ

Autodesk Construction Cloud

. Risk හි Customize Subcontractor Risk Today 1 **Quality Risk Factors** Burton Electric, Inc. High — A United Construction - \triangle <u>/</u>21 12 19 1 A Sierra Structures Med — Autodesk Med -HIGH RISK HIGH RISK ISSUES WATER RISK ISSUES OVERDUE ISSUES A Delta Engineers Med — SUBCONTRACTORS Acme Med -**Crystal Clear Glazing** Med _ Alpha Plumbing CONSTRUCTION IQ Low -Allied Architects Low _ Automation Company Low -Design Review Risk Factors **Bravo Electrical** Low _ Design Partnership Low -Exchange Low _ Golden Gate Low -S E \wedge E 2 5 10 2 4 Hitchcock Enterprises, Inc. Low _ LOngCompanyName Low -CODE CRITICAL DOCUMENTATION OVERDUE ISSUES OVERDUE **Owner's** Inc Low COMPLIANCE COMPONENTS INCOMPLETE REVIEWS Pype low -CONSTRUCTION IQ Prev 1 2 Next **RFI Risk Factors** Safety Risk Factors ? ---? 1 **0**9 EA 13 12 3 3 1 36 10 EX HIGH RISK RFIS DESIGN MEP AND DOCUMENTATION CODE HIGH RISK HIGH RISK ISSUES HOUSEKEEPING POSITIVE COORDINATION STRUCTURAL RFIS ERRORS COMPLIANCE SUBCONTRACTORS ISSUES OBSERVATIONS

Al in Construction: FUTURE



What if you could ask your project data anything?

AUTODESK Construction Cloud		
➢ Build ▼	Seaport Civic Center 🛞 👻	
Home		
🗊 Sheets	Project progress	
	-	
Ask Yo	our Specifica	ation 🎾
	-	
Sumn for th specit	narize all fire protection test e building and provide sourd fication sections.	ing requirements ces for all
— சூ Assets	+ Sheets	+ Members 2 photos we
🖆 Reports		
A Members	Work status	View Photos Manu Venugo
- Dridan	Your assigned work	
←	25 forms in progress	>

Search in Natural Language

Chat with your Models, Plans, Specs

Get Ad-hoc insights

Create summaries

Generate drafts for project updates

What if you could predict risk and make better decisions every day?

Quality Risk 🛈	Design Review Risk Factors						
Risk Today: High	CODE COMPLIANCE	CRITI	72 ICAL NENTS		818 NTION ETE		
Construction IQ	Construction IQ					Cor	
Subcontractor Risk Today			Qual	ity Risk Facto	irs		
Ceiling Experts	High	_					
Martha's Landscaping	High —		6	A	Δ.		
Rebar Co.	High	_	2	6		149	
Rebar Masters	High	-				ACCUEC	
Varsity Builders	High	-	SUB	CONTRACTORS	HIGH RISK	ISSUES	
Silver Oaks Appliances	High	-					
Steelers	High	-					
United Construction	High	-	Constr	uction IQ			
Xavier Rainscreens	High	-					
Carolina Fire	Med	_					



Data is the foundation to building strong AI

AEC Data Model is designed to make your data sets a valuable learning tool for your future AI needs



Data is the backbone but intelligence is the fuel for Transformation



Leveraging the Autodesk Platform







AUTODESK Construction Cloud

260+

Integration Partners connected to Autodesk Construction Cloud AUTODESK Platform Services

The Benefits of AI in Construction

Radical Efficiency Gains

Earlier Alternatives & Insights

Preserves Creativity & Control

Why Autodesk



AUTODESK

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