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Harnessing A.I. for the Future: Placer Solutions Construction Benchmark

Nate Fuller

Founder, Placer Solutions

#AGCTECH24

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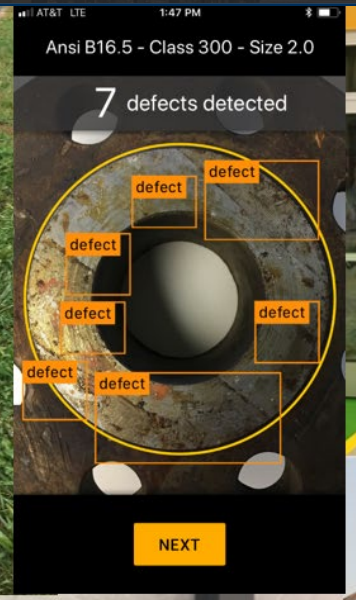
Nate Fuller, P.E.

- 15 years in civil engineering, construction management, and technology leadership
- Managed implementation of emerging technologies and helped build Office of Innovation at Bechtel
- Founded Placer Solutions in 2020 to consult on creating and accelerating technology adoption in construction



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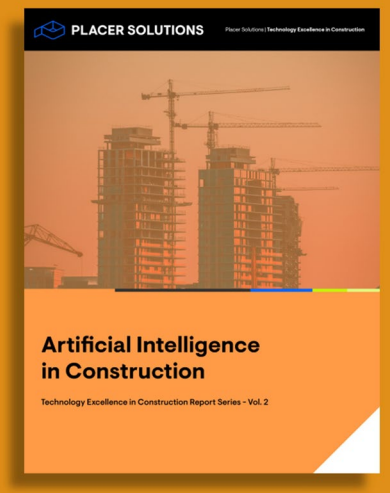
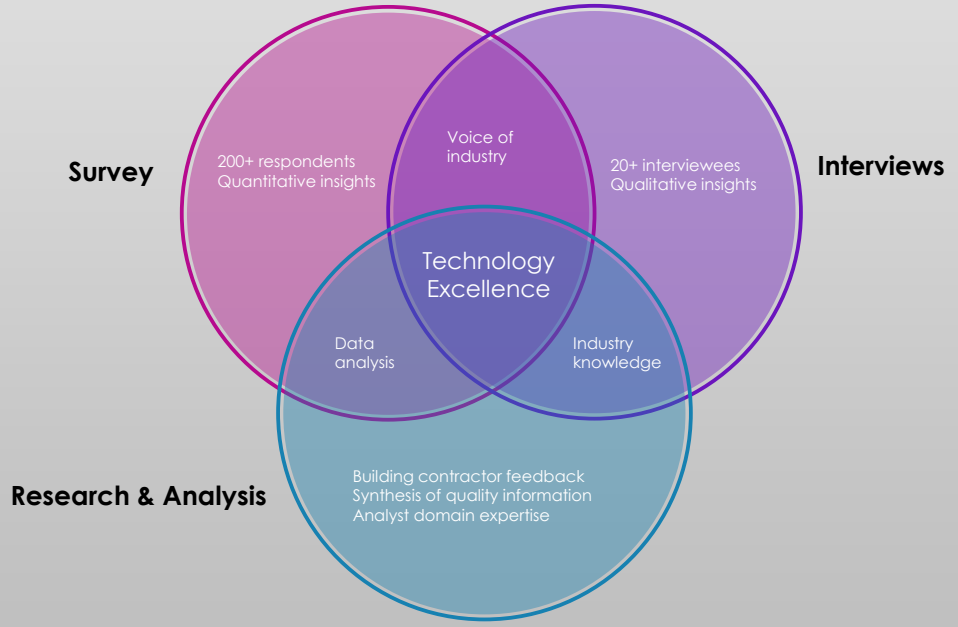
www.placersolutions.io/research-and-reports





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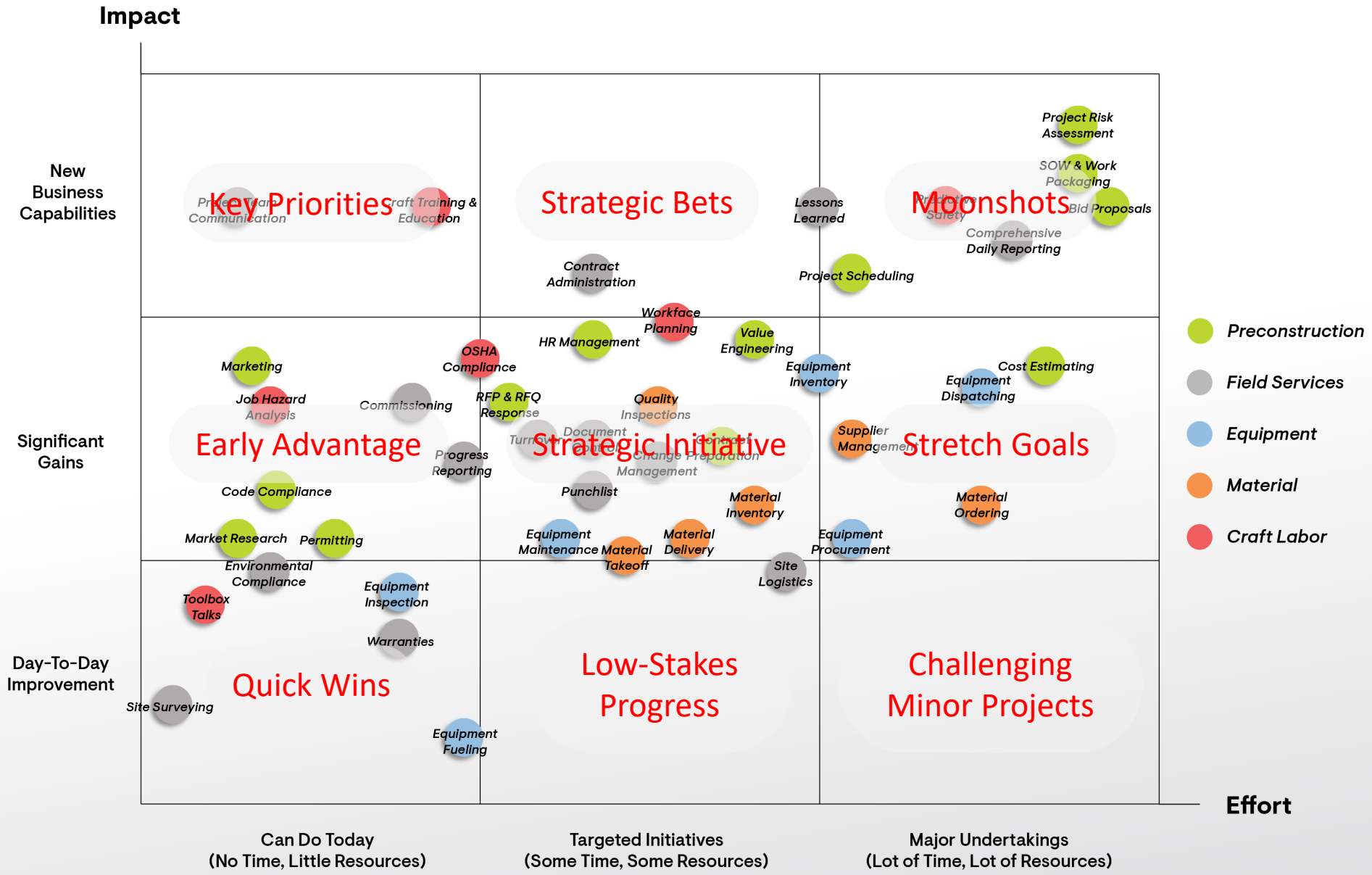
General sentiment on A.I. in construction

"One of the greatest challenges in construction management is how a single error can snowball into significant losses in terms of time, money, and other risk elements. This technology can ultimately be very useful in construction management if the output is validated by someone who knows."

Heather Pettijohn
Lean Evolution Manager at Barton Malow

"Our policy change mirrors our social media guidelines. It doesn't allow the release of company, client, or trade secret information. When using consumer products like ChatGPT, we assume that the information is now in the public domain."

Mark Trednick
CIO at Haskell



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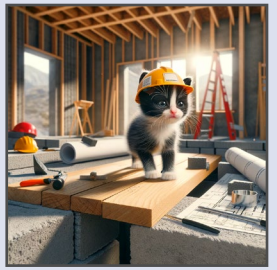
Explain in plain language

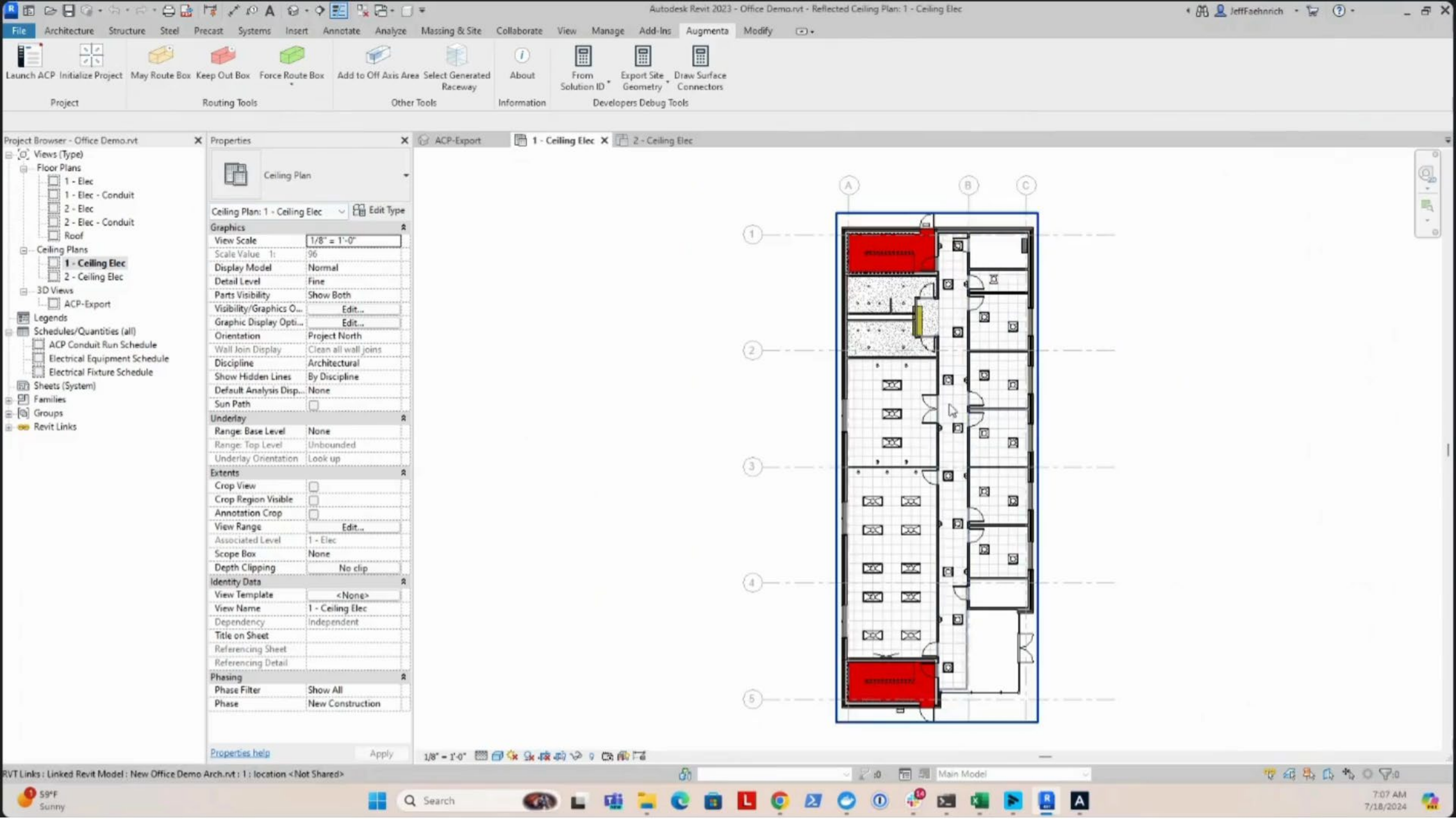
"Cute cat at a construction site"

Ideas Generation



Refinement

"I like the second cat but put an orange hard hat on him and make him look like a boss"


Autodesk Revit 2023 - Office Demo.rvt - Reflected Ceiling Plan: 1 - Ceiling Elec
File
Architecture
Structure
Steel
Precast
Systems
Insert
Annotate
Analyze
Massing & Site
Collaborate
View
Manage
Add-Ins
Augmenta
Modify
Launch ACP
Initialize Project
Project
May Route Box
Keep Out Box
Force Route Box
Routing Tools
Add to Off Axis Area
Select Generated Raceway
Other Tools
About
Information
From Solution ID
Export Site Geometry
Draw Surface Connectors
Developers Debug Tools
Project Browser - Office Demo.rvt
Views (Type)
Floor Plans
1 - Elec
1 - Elec - Conduit
2 - Elec
2 - Elec - Conduit
Roof
Ceiling Plans
1 - Ceiling Elec
2 - Ceiling Elec
3D Views
ACP-Export
Legends
Schedules/Quantities (all)
ACP Conduit Run Schedule
Electrical Equipment Schedule
Electrical Fixture Schedule
Sheets (System)
Families
Groups
Revit Links
Properties
Ceiling Plan
Ceiling Plan: 1 - Ceiling Elec
Edit Type
Graphics
View Scale 1/8" = 1'-0"
Scale Value 1: 96
Display Model Normal
Detail Level Fine
Parts Visibility Show Both
Visibility/Graphics O... Edit...
Graphic Display Opti... Edit...
Orientation Project North
Wall Join Display Clean all wall joins
Discipline Architectural
Show Hidden Lines By Discipline
Default Analysis Disp... None
Sun Path
Underlay
Range: Base Level None
Range: Top Level Unbounded
Underlay Orientation Look up
Extents
Crop View
Crop Region Visible
Annotation Crop
View Range Edit...
Associated Level 1 - Elec
Scope Box None
Depth Clipping No clip
Identity Data
View Template <None>
View Name 1 - Ceiling Elec
Dependency Independent
Title on Sheet
Referencing Sheet
Referencing Detail
Phasing
Phase Filter Show All
Phase New Construction
Properties help
Apply
ACP-Export
1 - Ceiling Elec
2 - Ceiling Elec
A
B
C
1
2
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4
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1/8" = 1'-0"
RVT Links : Linked Revit Model : New Office Demo Arch.rvt : 1 : location <Not Shared>
Main Model
59°F
Sunny
Search
7:07 AM
7/18/2024

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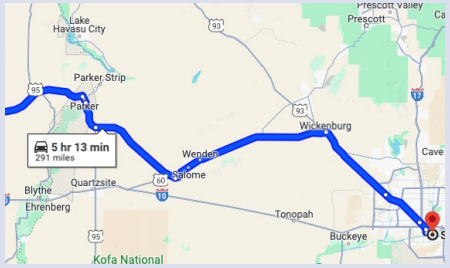
Updates when changes happen

“I changed the route”
“Traffic accident”
“Coffee break”



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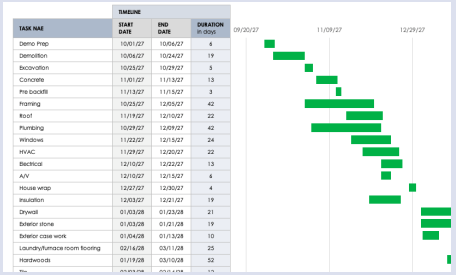
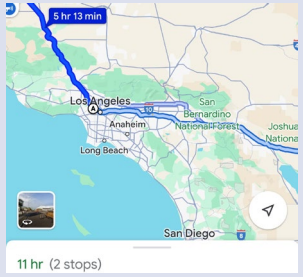


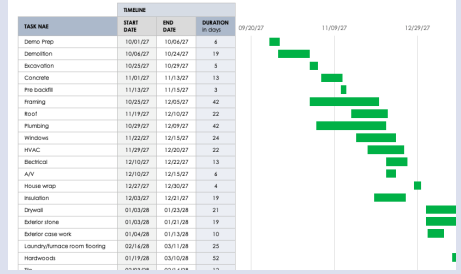
Instant what-if scenarios

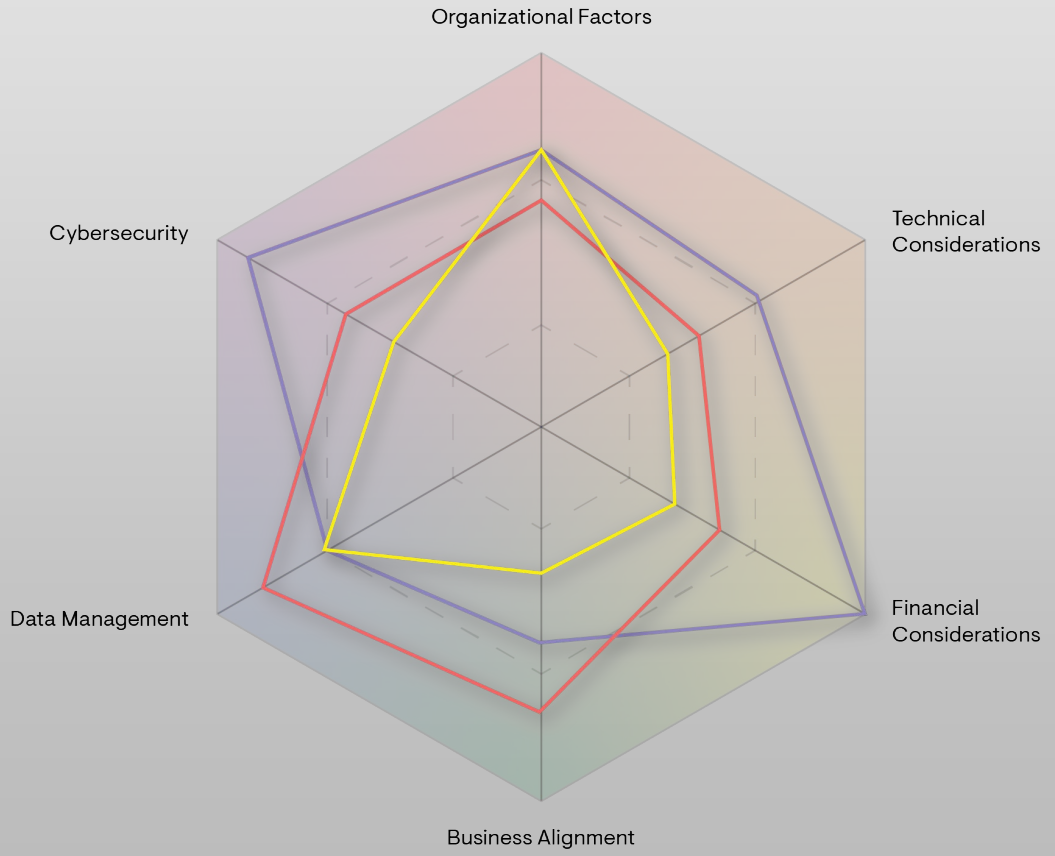
“What if we pass through Hollywood?”



“What if we change the layout to X?”

- ☑ *Permit re-submission*
- ☑ *Foundation demolition*





Six challenges in A.I. adoption:

- Business Alignment – back office-to-field divide
- Technical Considerations – high proportion of “shadow IT” in construction
- Data Management – unstructured data and siloed processes
- Security Considerations – critical infrastructure projects in construction
- Organizational Factors – change management in a traditional industry
- Financial Considerations – investment horizon

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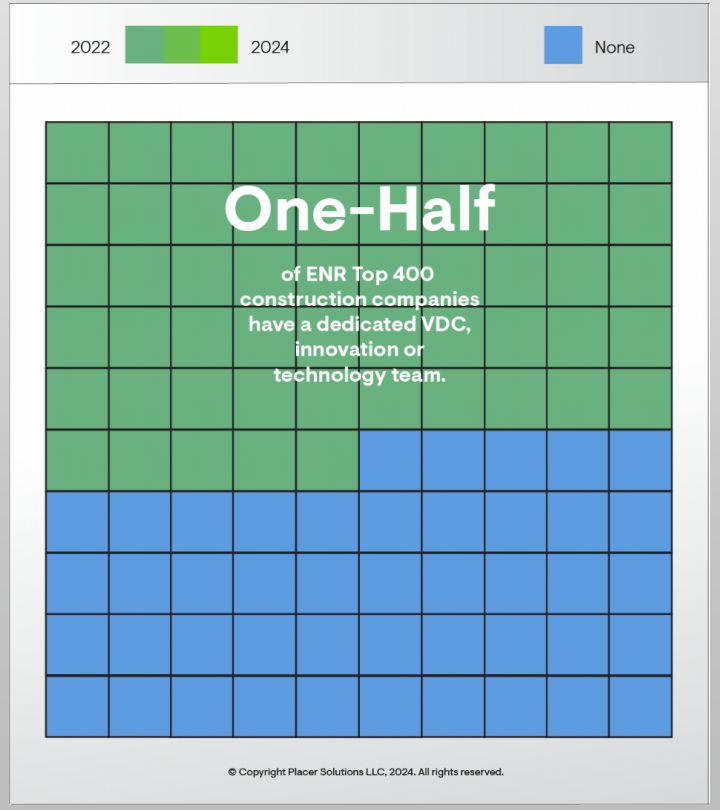
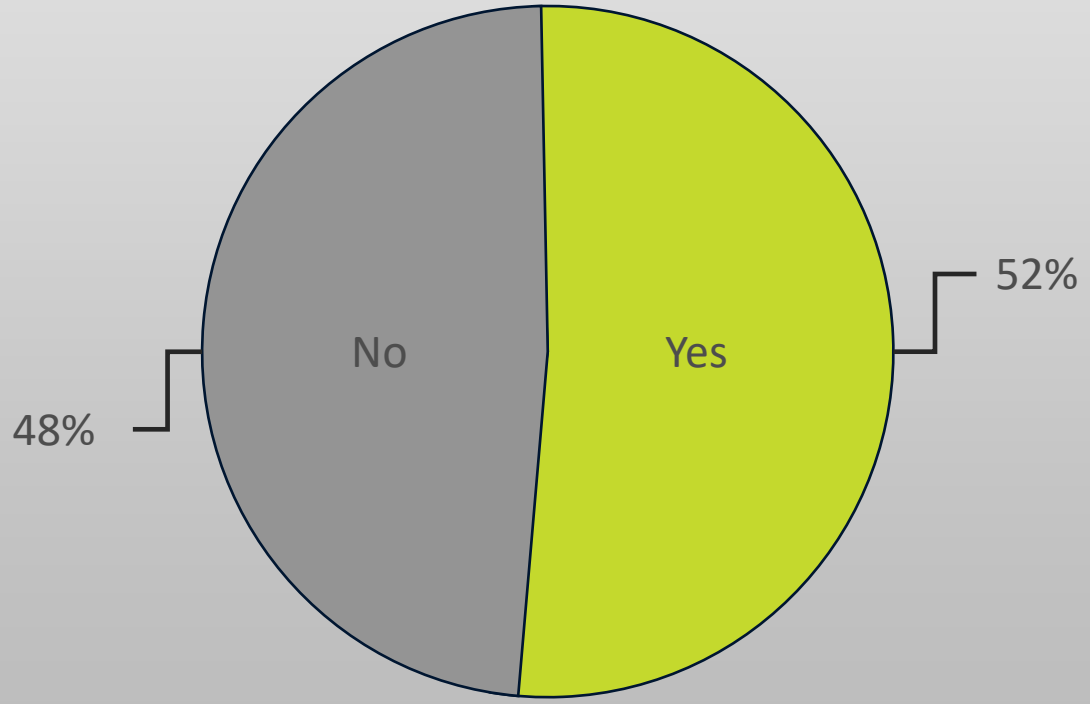
Construction is increasingly accepting A.I. and emerging technology.

Concepts like generative A.I. that were foreign to the industry 10 years ago are making their way into executive-level conversations.

This is driven by a profound transformation happening in our industry, fueled by the rapid adoption of technologies like ChatGPT and a slow-moving functional shift towards dedicated operational technology departments like VDC.





Half of respondents have dedicated emerging technology resources.

The average reported annual budget is around $200-300K, which indicates a small team of one or two. This aligns with industry surveys done by Placer Solutions.

Several respondents said things like: *“Nothing is dedicated, but everyone on the staff knows we will look at anything they may find.”*

Get All A.I. Readiness Benchmark Results

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Virtual Design &
Construction Department

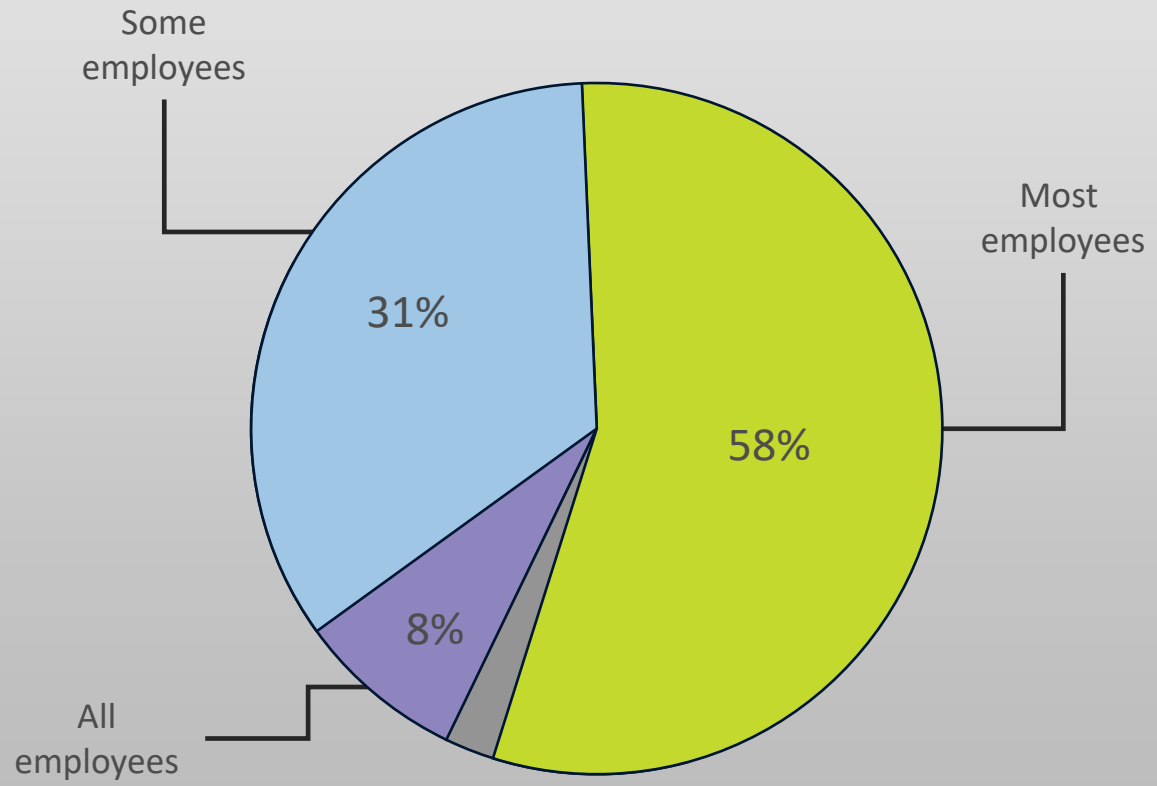
Construction Technology
Department

Innovation Department

Construction technology departments pushing A.I. forward.

The fragmented emerging technology departments in construction reflect our fragmented industry. General building contractors accustomed to using BIM are driving A.I. initiatives through Virtual Design & Construction, others are leaning into Construction Technology or Innovation Departments.

Get All A.I. Readiness Benchmark Results



Respondents claim a high degree of receptiveness in their organization.

A significant part of A.I. readiness involves organizational change and helping employees understand risks associated with the A.I. tools that are available. The benchmark examines areas like learning and development, communication of changes, and champion networks.

Get All A.I. Readiness Benchmark Results

IT Operations & Maintenance Team

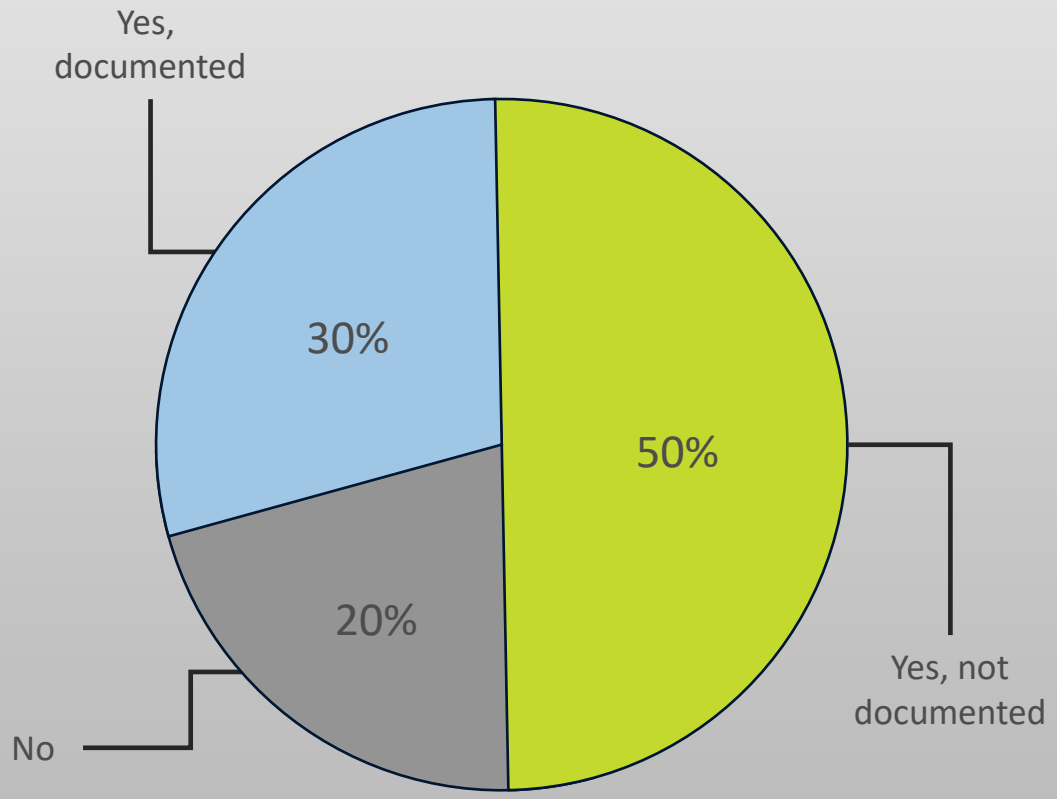
IT Infrastructure Team

Data Management Team

IT departments are evolving to address A.I. implementation.

Construction companies are beginning to include data management as part of their IT teams. These teams are responsible for consolidating fragmented data systems, addressing unique security threats, ensuring data integrity and accessibility, and providing ongoing support and training to staff to maximize the benefits of A.I. technologies.

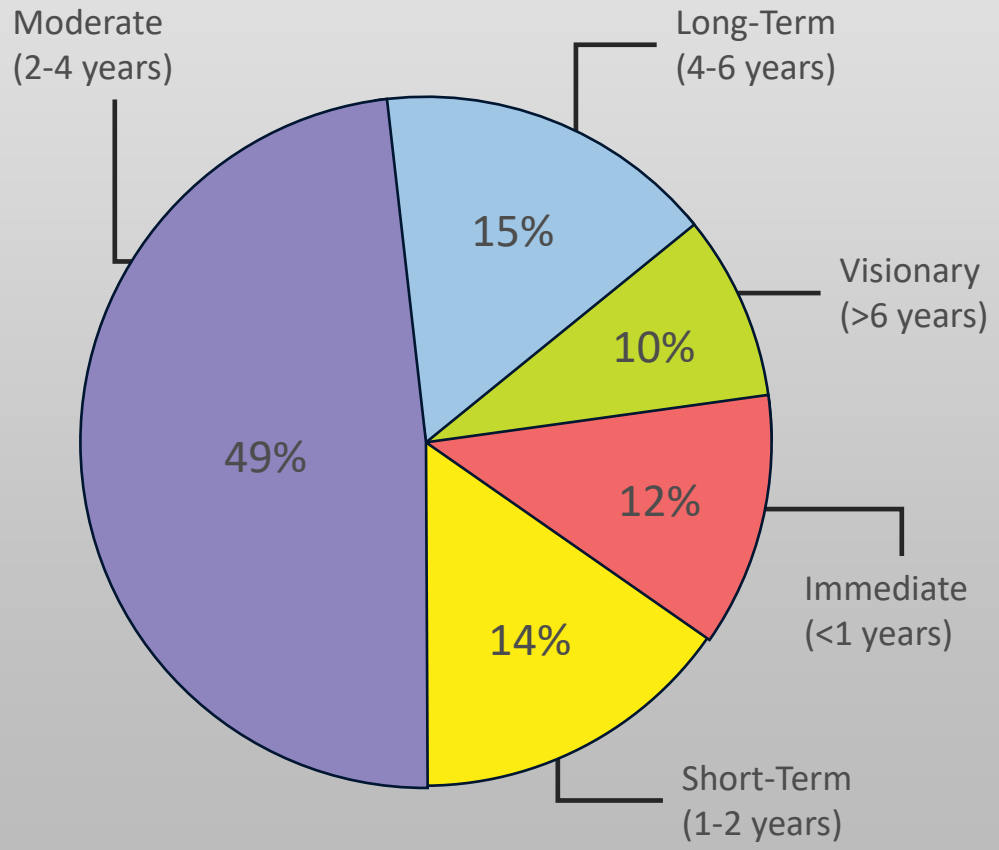
Get All A.I. Readiness Benchmark Results



Most respondents have a change strategy to achieve business goals.

Although not always documented, having a change strategy in place to achieve A.I. business goals is a first step. Best practices involve creating A.I. committees or cross-functional teams who can help with business alignment.

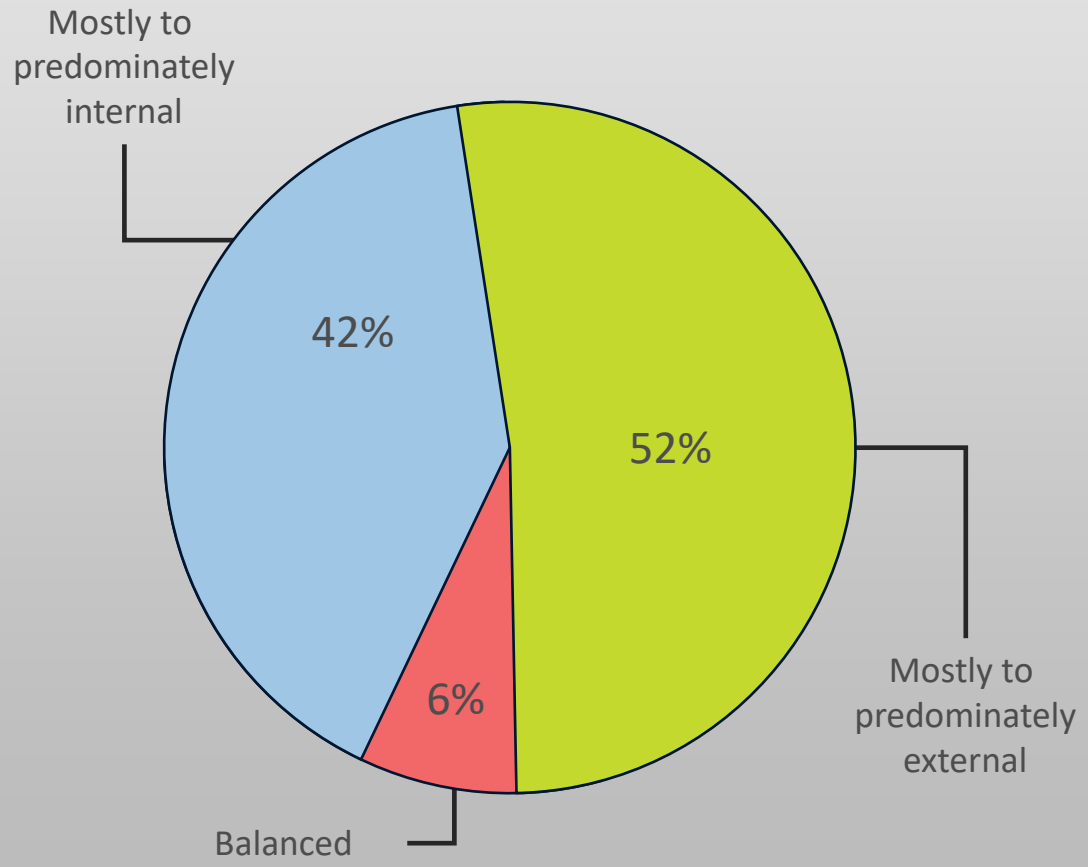
Get All A.I. Readiness Benchmark Results



Moderate investment timeframes are the norm in construction.

Many respondents say that their technology investment timeframe is on a moderate timeline of 2-4 years while about one-quarter expect immediate or short-term ROI.

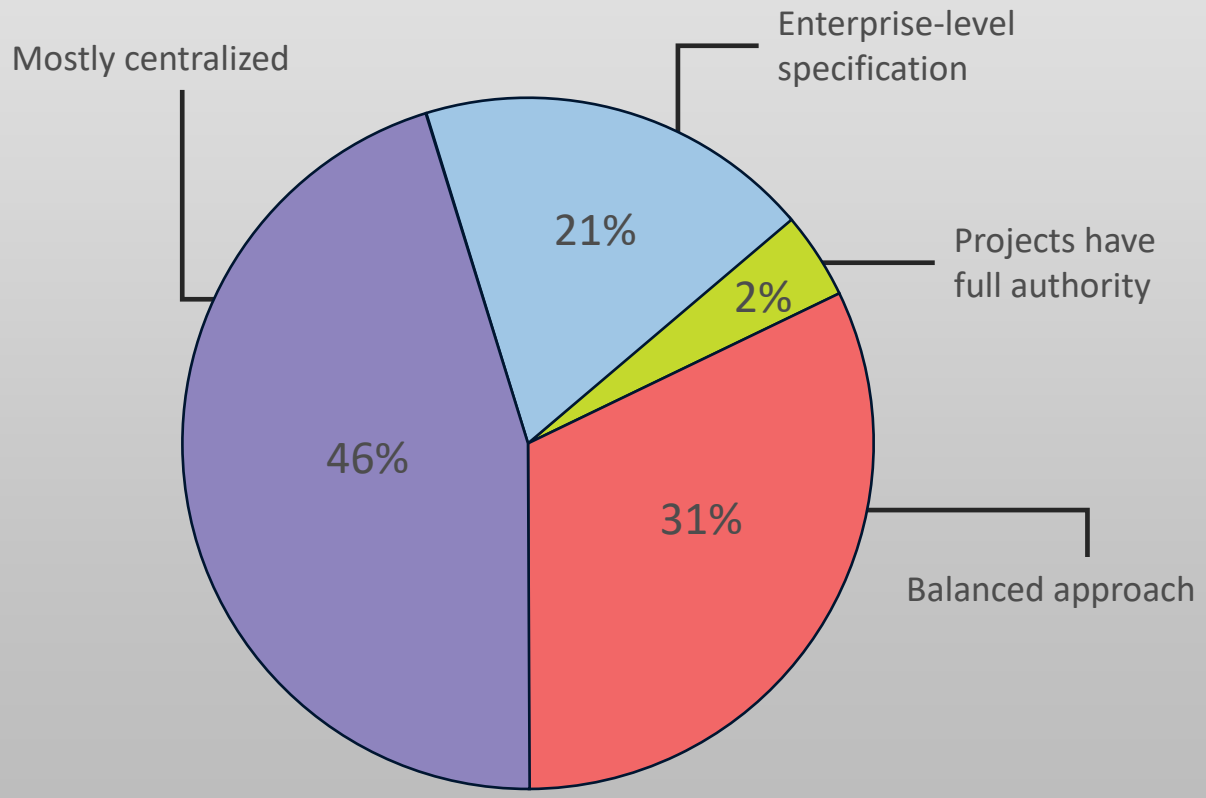
Get All A.I. Readiness Benchmark Results



Sourcing external solutions is the preferred method of A.I. adoption, although there's a mix.

The vast majority of construction companies say that they "predominately" source external solutions (more than 90%). However, larger companies among our respondents indicate that they are also building and experimenting with internal solutions for their businesses.

Get All A.I. Readiness Benchmark Results



Construction companies are balancing centralized specification with project level decision-making.

The construction industry is unique with its project and field-based project delivery method. A.I. presents an amazing opportunity to accelerate citizen development with no or low-code solutions.

Get All A.I. Readiness Benchmark Results

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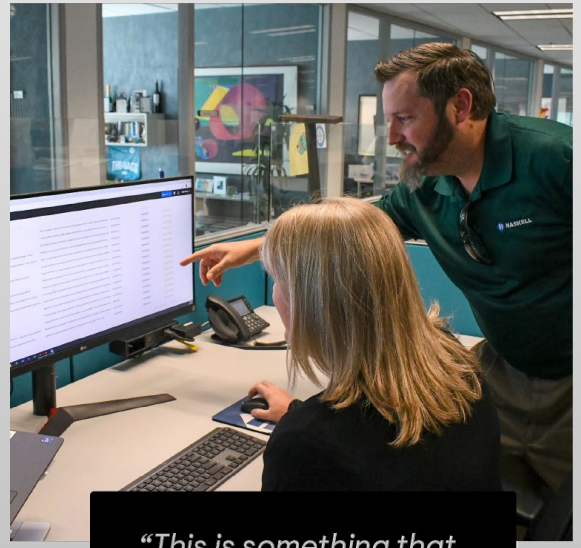
Measured A.I. Policy

Haskell implemented a robust policy that emphasizes information security and public awareness, coupled with educational measures for employees. Parallel to policy updates, Haskell is fostering innovation by encouraging A.I. exploration in engineering design and establishing an A.I. Coordination Group for strategic discussions on A.I. implementation across departments.



"This is something that is not going to go away. It is big enough that we need to pay attention to it."

— Mark Trednick, Haskell CIO

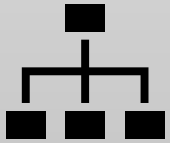
Best Practices for Construction

The construction industry is exploring the potential of text-based A.I. like GPT-4, but adoption requires careful planning at individual, organizational, and industry levels. Early preparation and responsible governance are key to leveraging A.I. as a strategic advantage in construction.

Individual

Think of text-based A.I. as a **tool that augments human expertise**, not replaces it. While text-based A.I. can automate mundane tasks, the output still requires **human validation**.

Knowledge workers → "knowledgeable" workers



Firm

Outline clear protocols for acceptable use, and keep your team updated through **educational initiatives**. Investing in expert support to set up secure, customized **internal applications** can be a game-changer.

Industry

Sharing key insights and practices can fast-track the industry's digital transformation. Moreover, text-based A.I. has the capacity to be a catalyst for **workforce development**.

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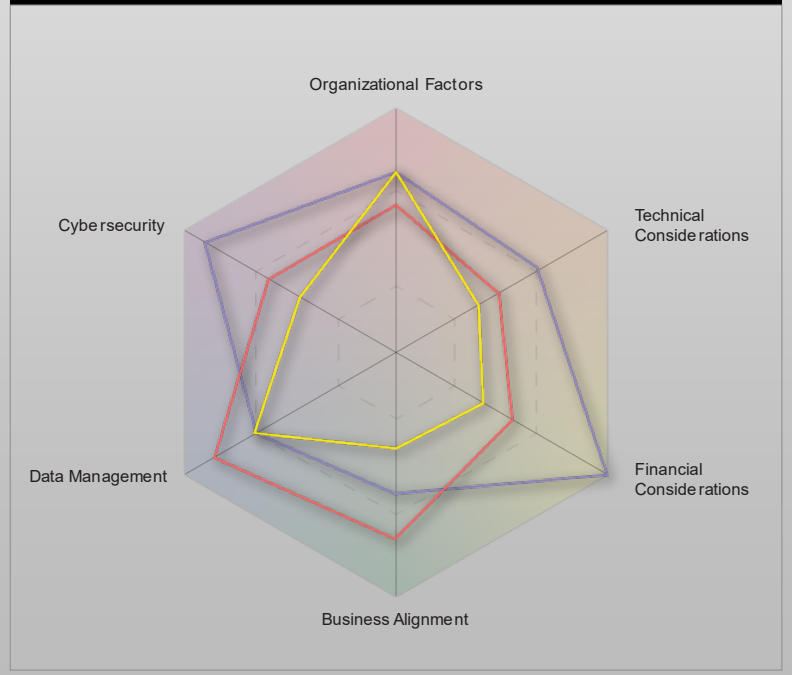

Unlocking the Future: A.I. Readiness in Construction

The impact of A.I. on modern organizations is undeniable. Our A.I. Readiness in Construction Benchmark provides leaders with actionable insights into their organization's technological readiness.

Participants receive a detailed, personalized report with strategic recommendations, aiding decision-making and pinpointing areas for investment. Empower your construction business to innovate, compete, and lead in the digital age.