Dark Data: What You Don't Know CAN Hurt You

Moderator:

Jeff Rubenstone, *Deputy Editor, News,* ENR

Joel Hutchines, *Chief Product Officer*, Slate Technologies

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“You cannot make progress without making decisions.”

The 7 steps of Decision Making

1. Define the problem or decision to be made
2. Gather information and data
3. Identify possible solutions or courses of action
4. Evaluate the alternatives and choose a solution
5. Implement the chosen solution
6. Monitor and evaluate the outcome of the decision
7. Adjust the decision as needed based on results

AI: The Construction Game-Changer

Traditionally these decisions are made relying on gut instinct, past experiences, and industry knowledge.

Now Ai is changing the way we do things, including how we make decisions.

Ai is a tool that can drastically change and improve the way we make decisions, not by relying on gut but rather contextualized data you don’t normally see.

Now for Construction…. What is the cost of a bad decision?

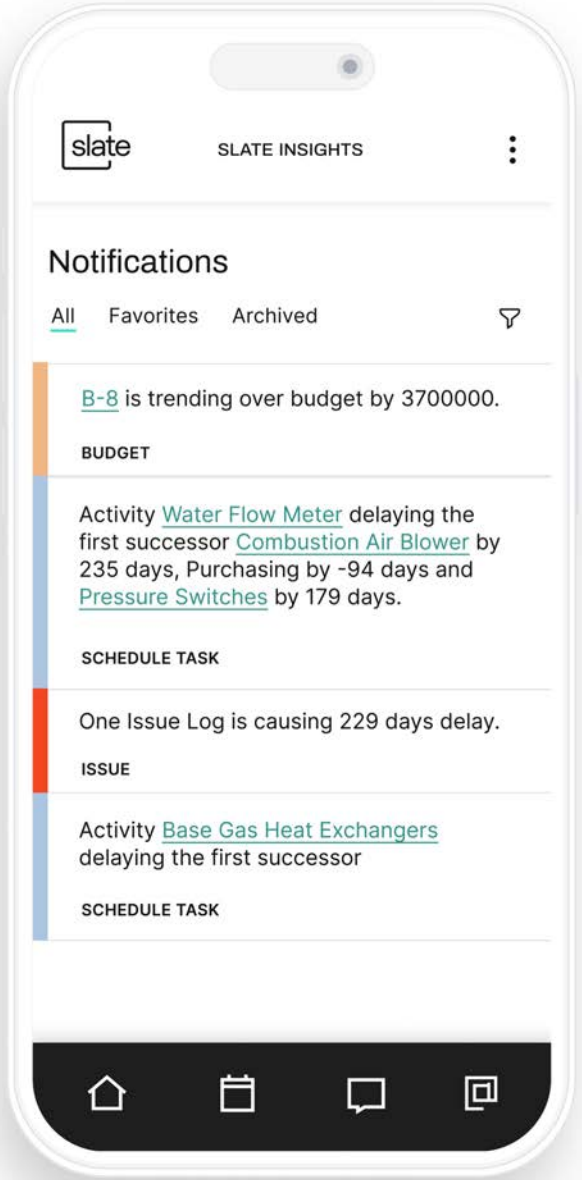
Traditional decision making in construction resembles more of a guessing game, a gut-check.

The same mistakes are made time and time again.

From Process to Product

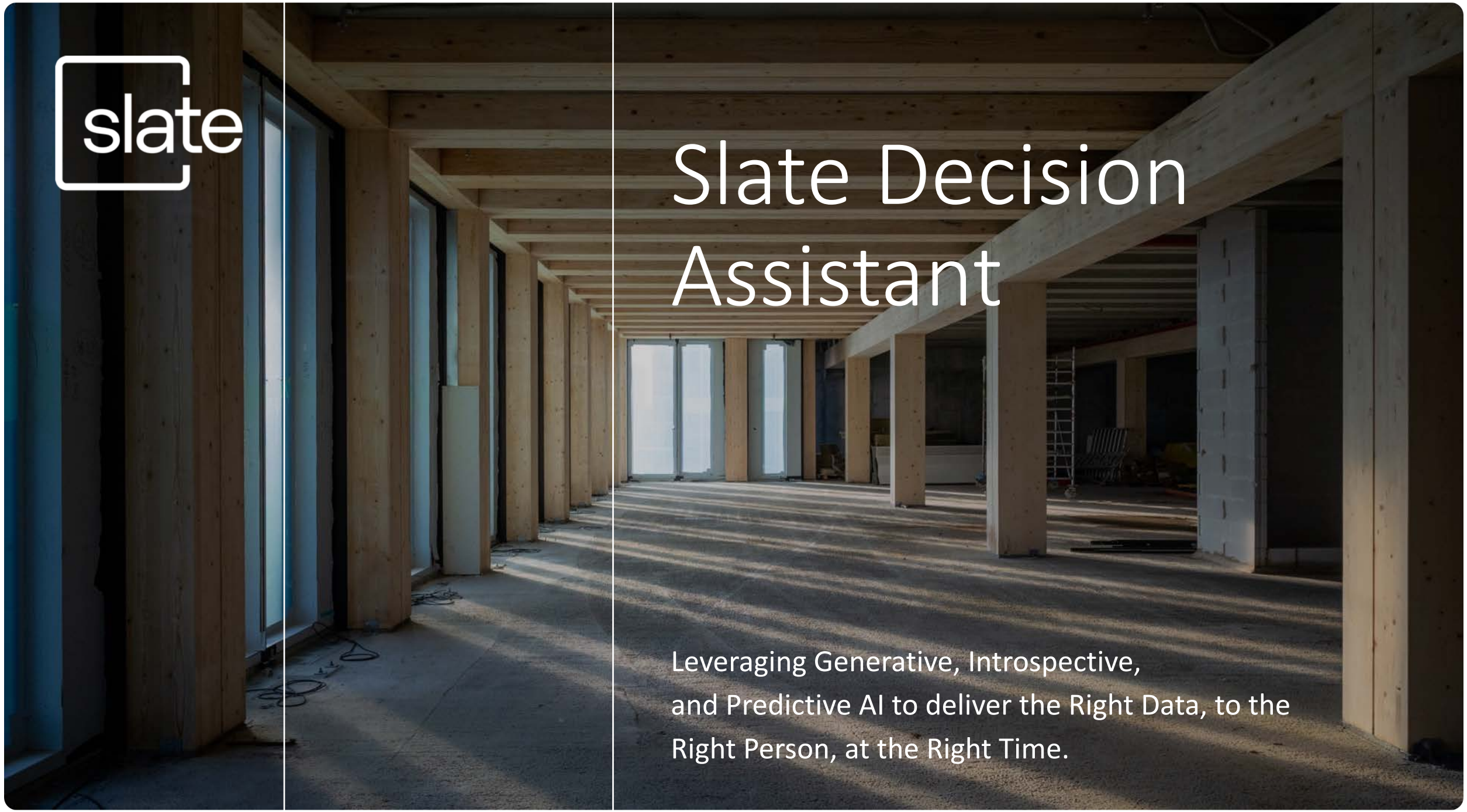
With AI, your decision-making becomes a product. Like an ever-learning helper-bot that gets better with each job, making your work smoother and smarter.

What is the Cost of a Bad Decision?



slate

The Decision is yours. Are you a leader or a follower?



Slate Decision Assistant

Leveraging Generative, Introspective,
and Predictive AI to deliver the Right Data, to the
Right Person, at the Right Time.

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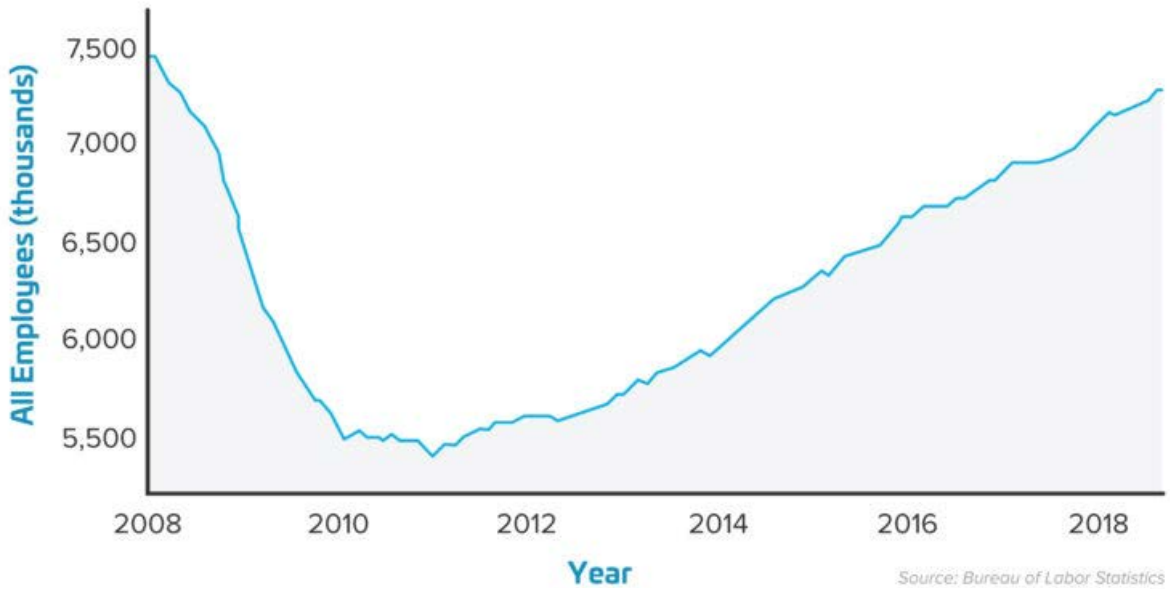
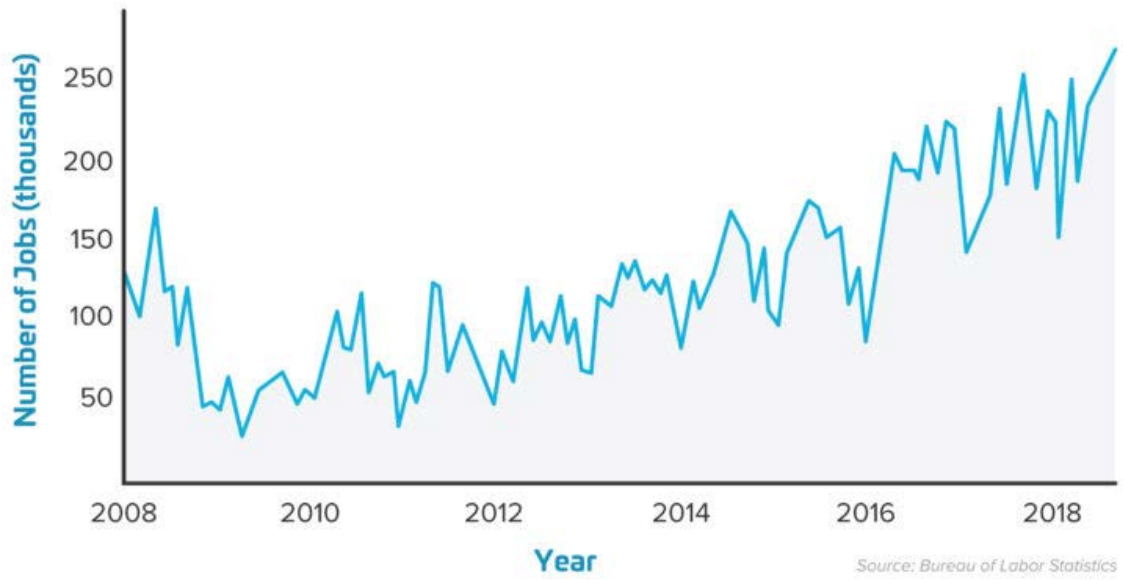
"What are we doing with our data?"
"What are we missing?"
"Why should we care?"

Number of Employees in Construction



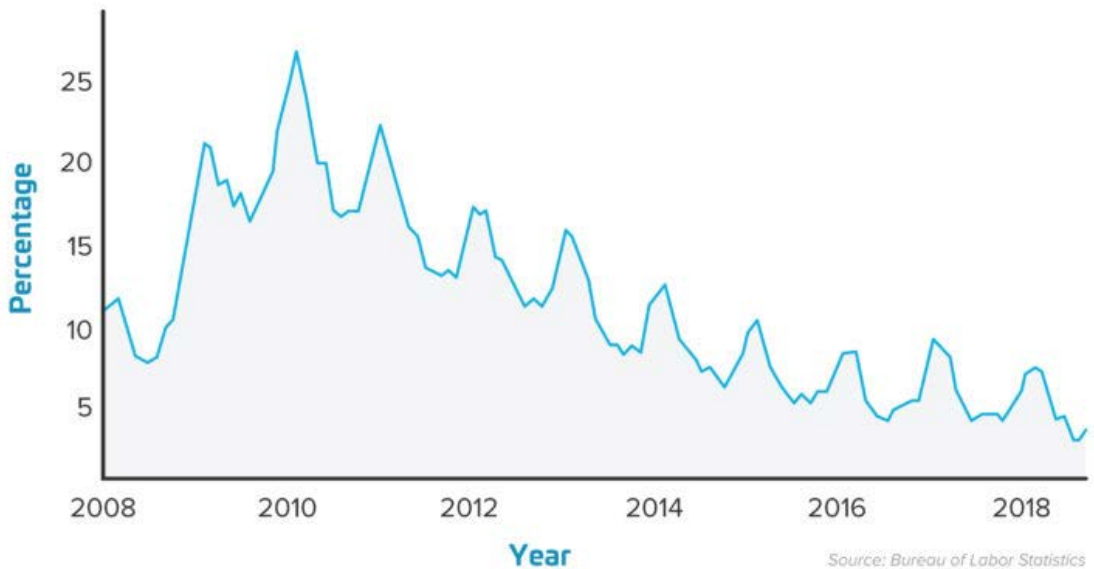
Source: Bureau of Labor Statistics

Number of Unfilled Jobs in Construction



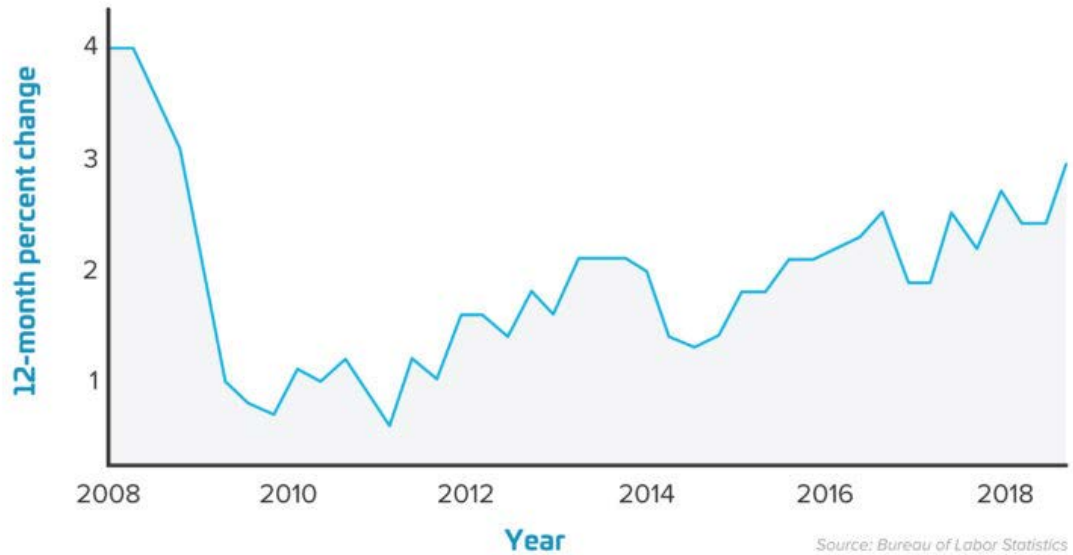
Source: Bureau of Labor Statistics

Unemployment % in Construction



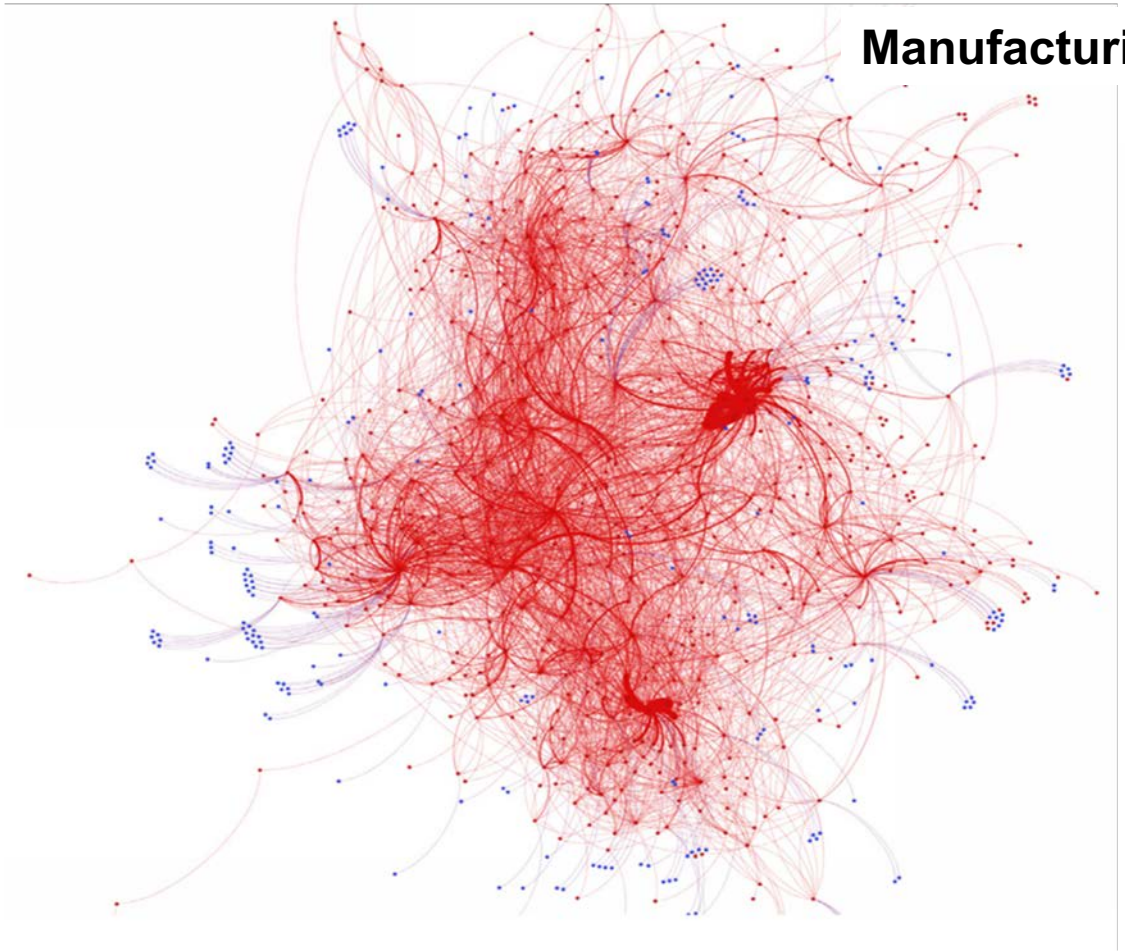
Source: Bureau of Labor Statistics

% Change in Compensation for Construction Workers

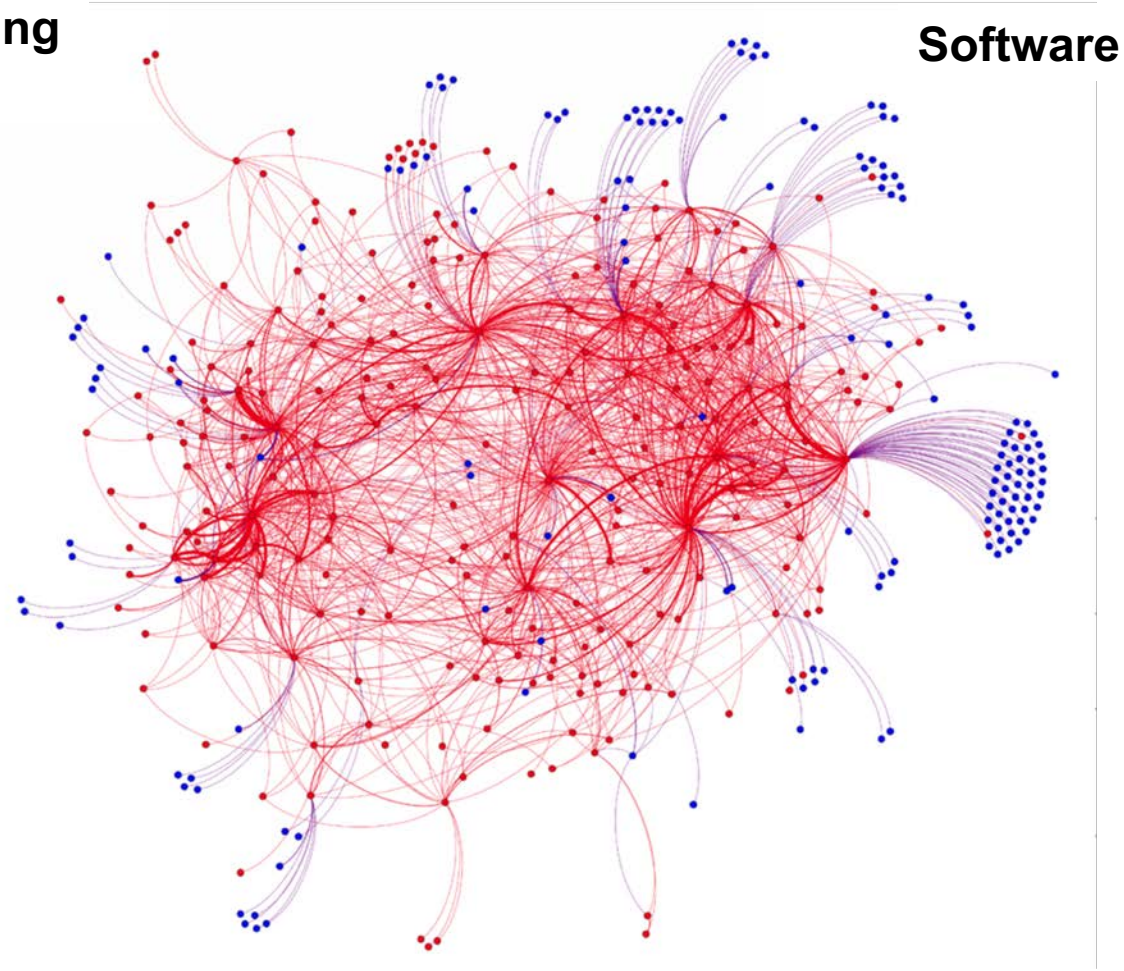


Source: Bureau of Labor Statistics

Manufacturing



Software



Red Node: Individual company user

Blue Node: Individual external user

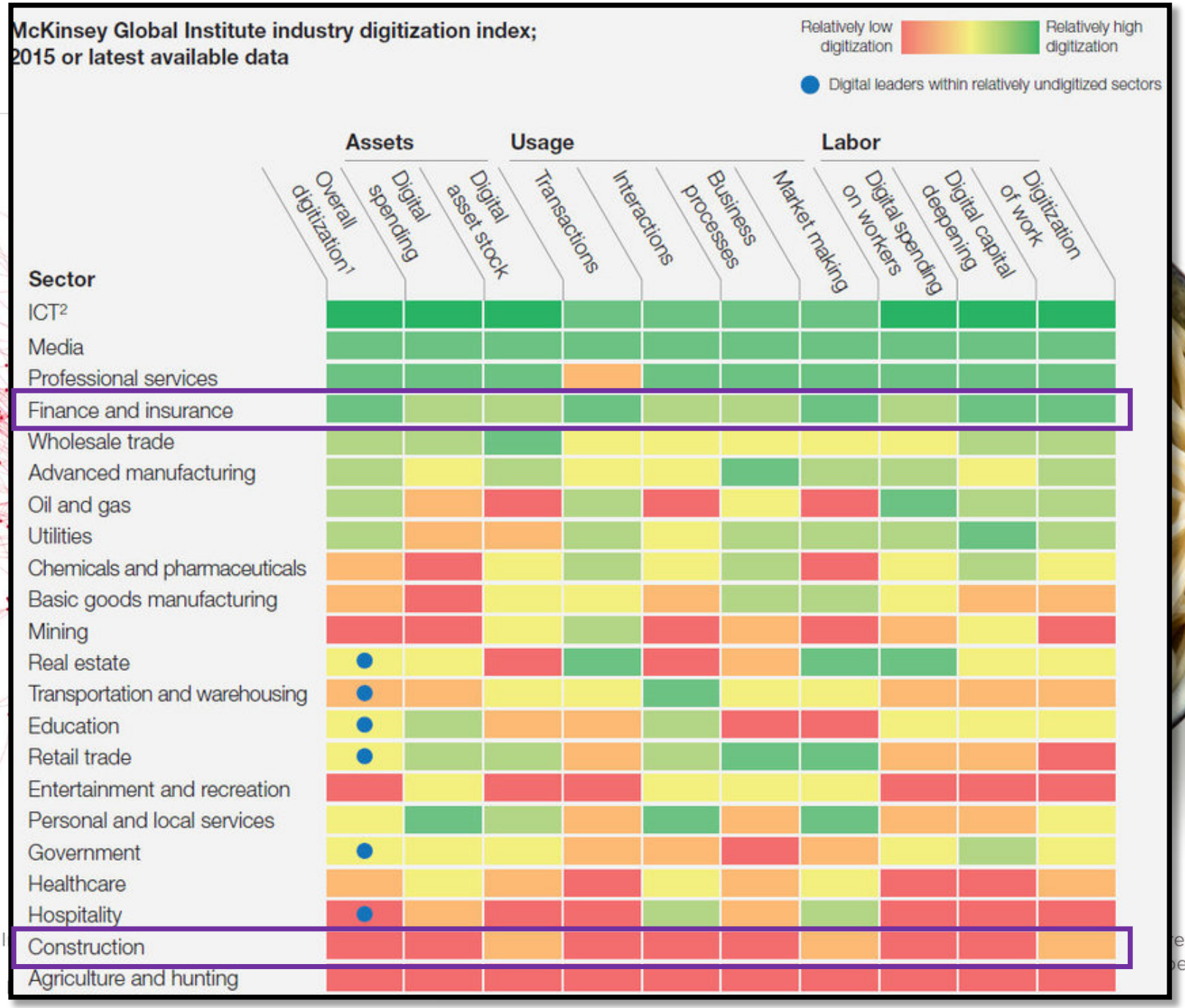
Red Edge: Connection from internal user

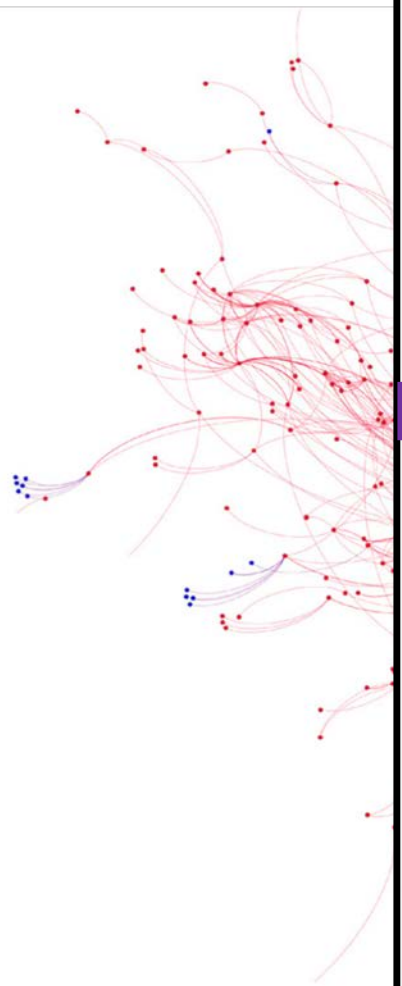
Blue Edge: Connection from external user

Edge Weight: Thicker edge represents more frequent connections between users

https://cdn.base.parameter1.com/files/base/acbm/fcp/document/2014/06/box-cloud-study_11535206.pdf

Construction





Red Node: I

Blue Node:

epresents
etween users

Data Sources

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1. Better understand what types of data PCL routinely generates on projects and how it relates to operational performance.

2. Create better ways to communicate with that data and identify missed analytical opportunities.

3. Use the combined data to **automatically generate actionable insights that will benefit project outcomes**.

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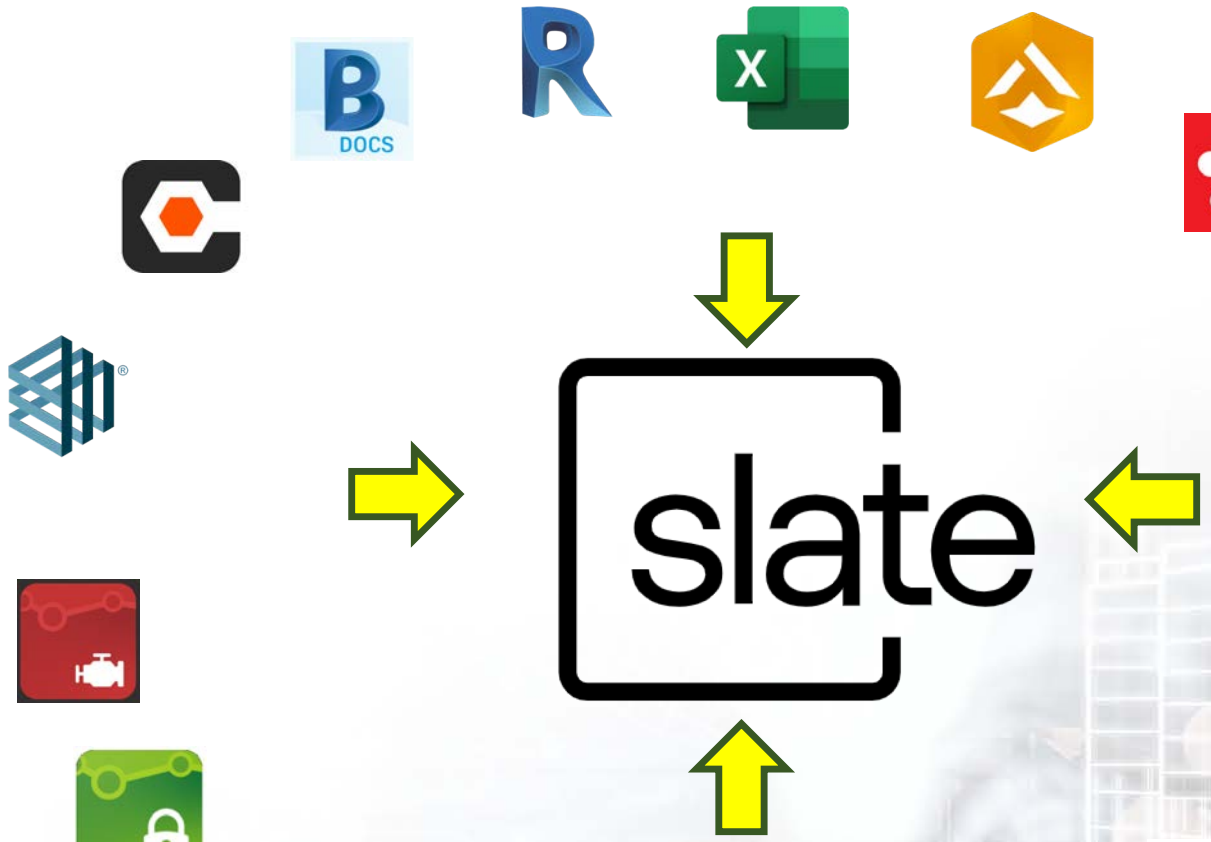

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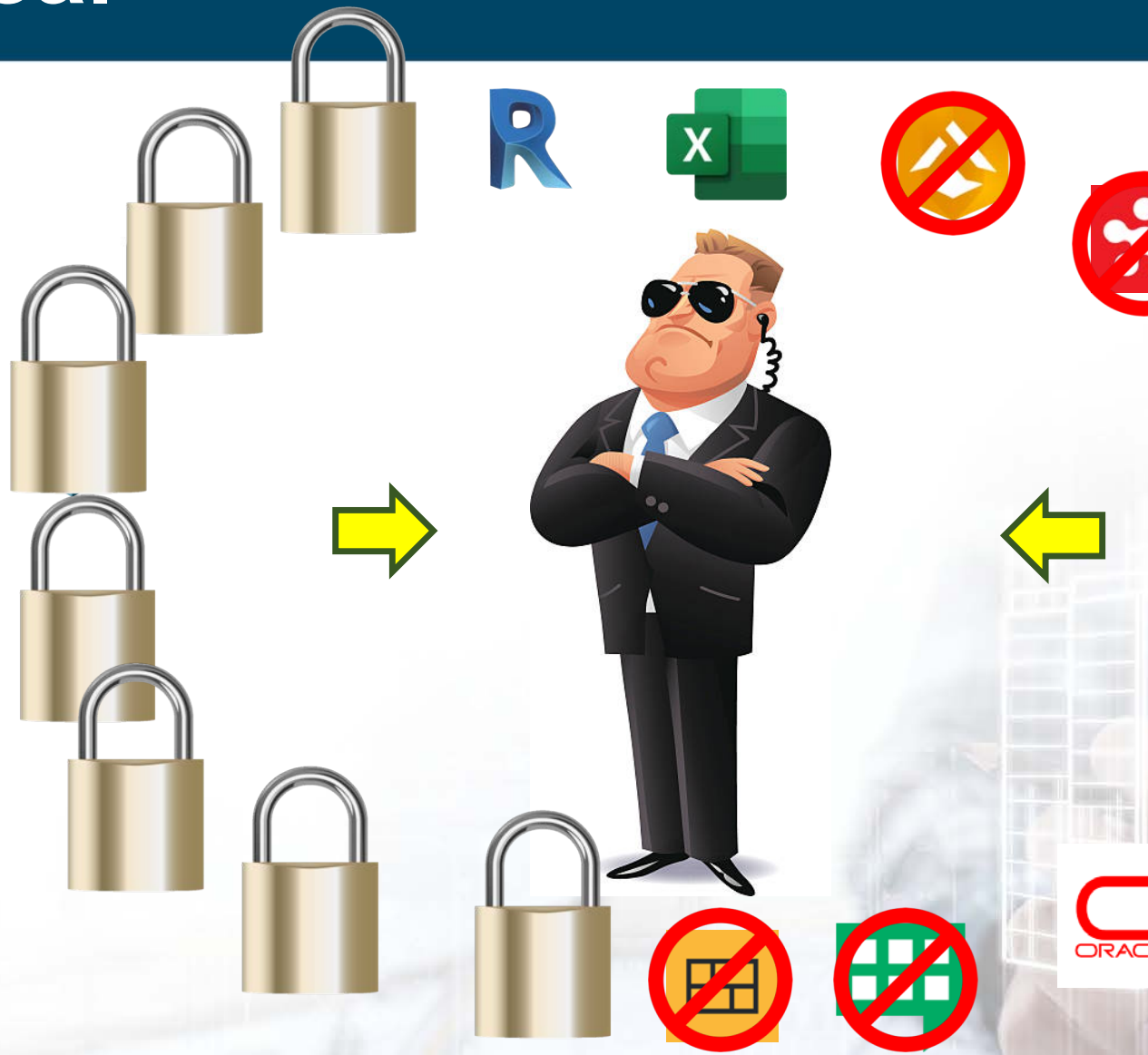

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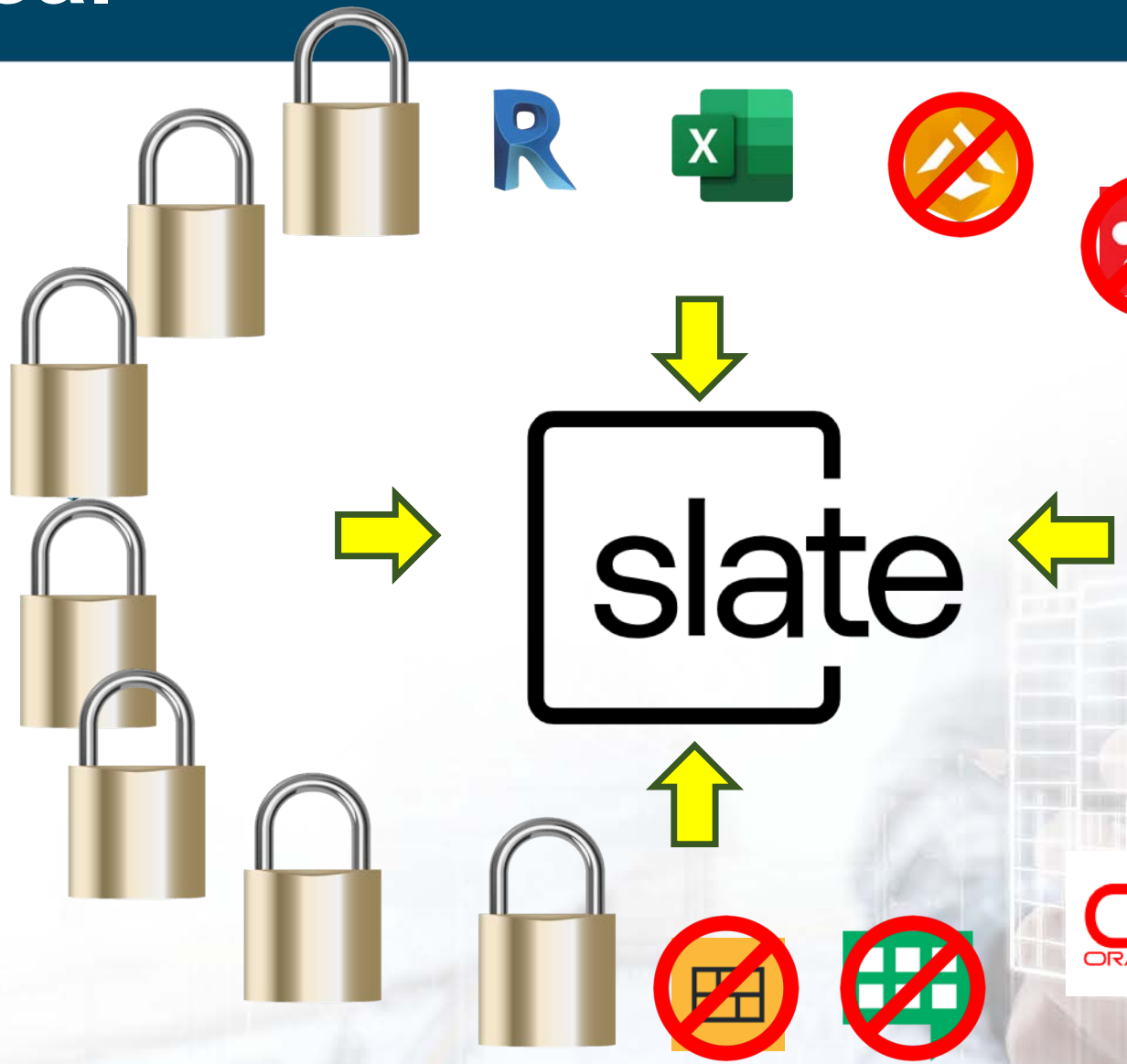

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B DOCS

B FIELD

ORACLE

Technical

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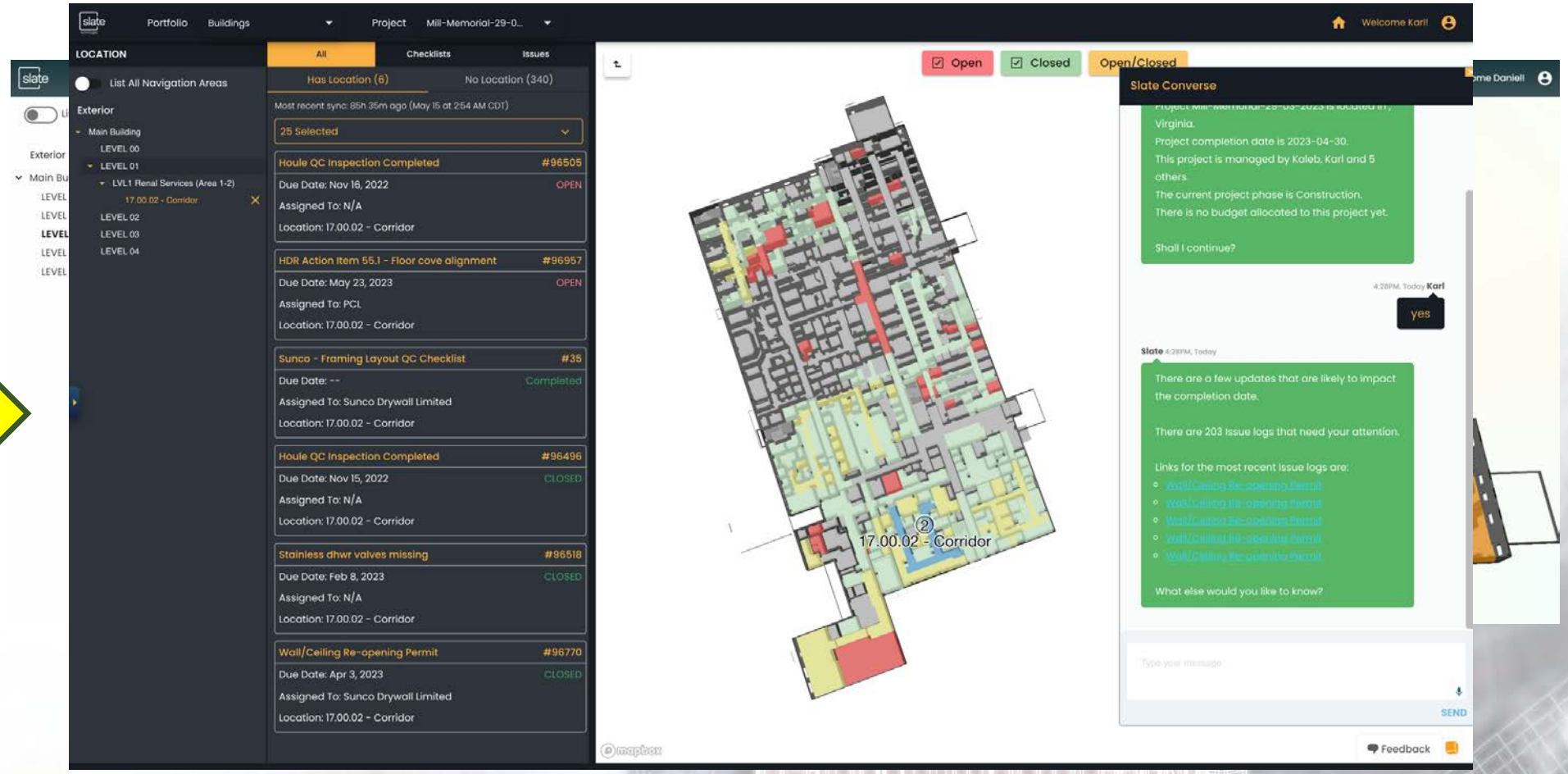

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Culture

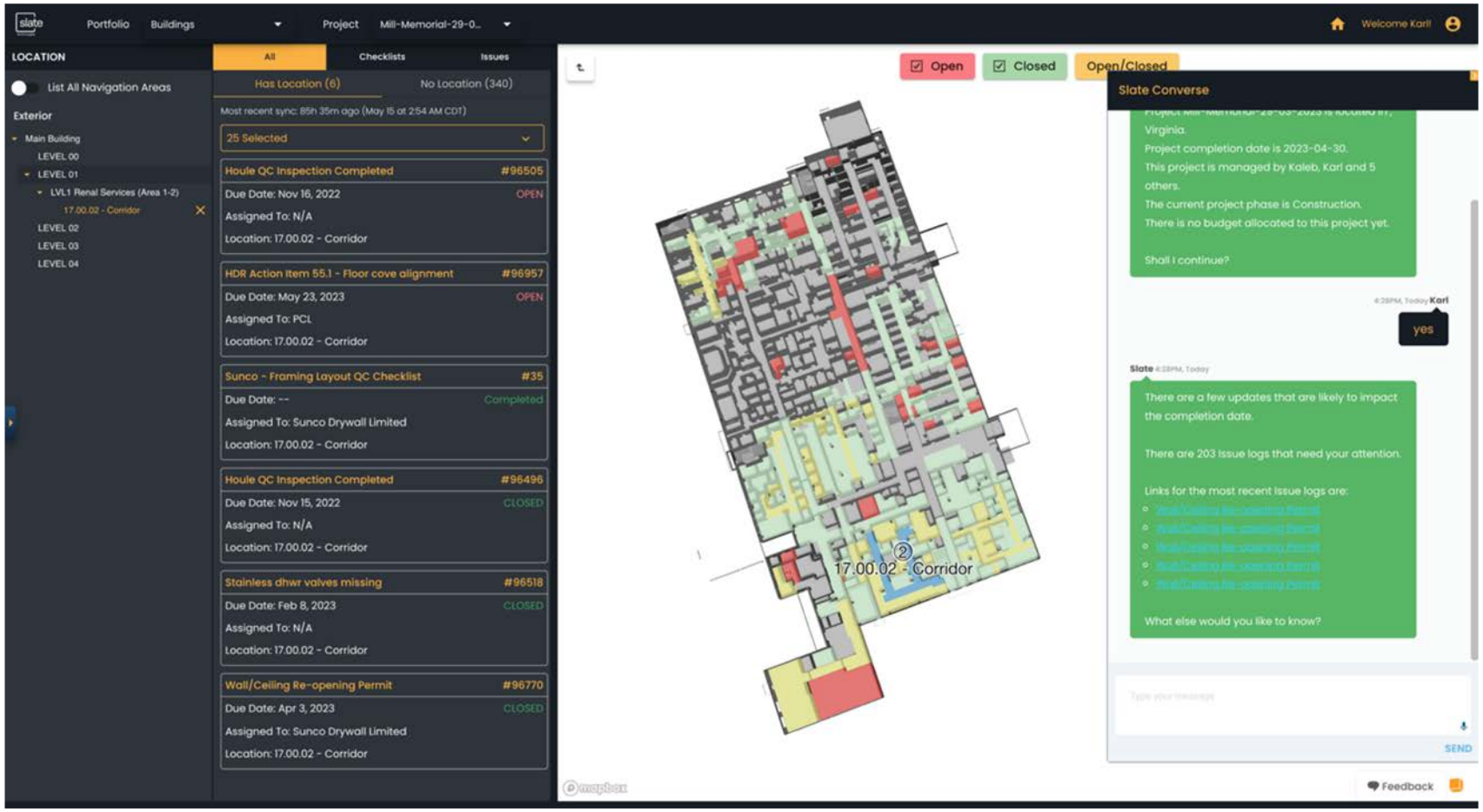
Culture

"Artificial Intelligence!?! What about all the natural stupidity…"

"I don't need NITENDO to tell me how to do my job"

WELCOME
to Fabulous
LAS VEGAS
NEVADA
WINS

This isn't so scary!



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Generative AI has accelerated in application in 2022-23

GenAI image wins art prize

Chatbot passes US law and business exams

Code assistant increases productivity by 55%

1. Source: https://www.cnn.com/2023/01/26/tech/chatgpt-passes-exams/index.html

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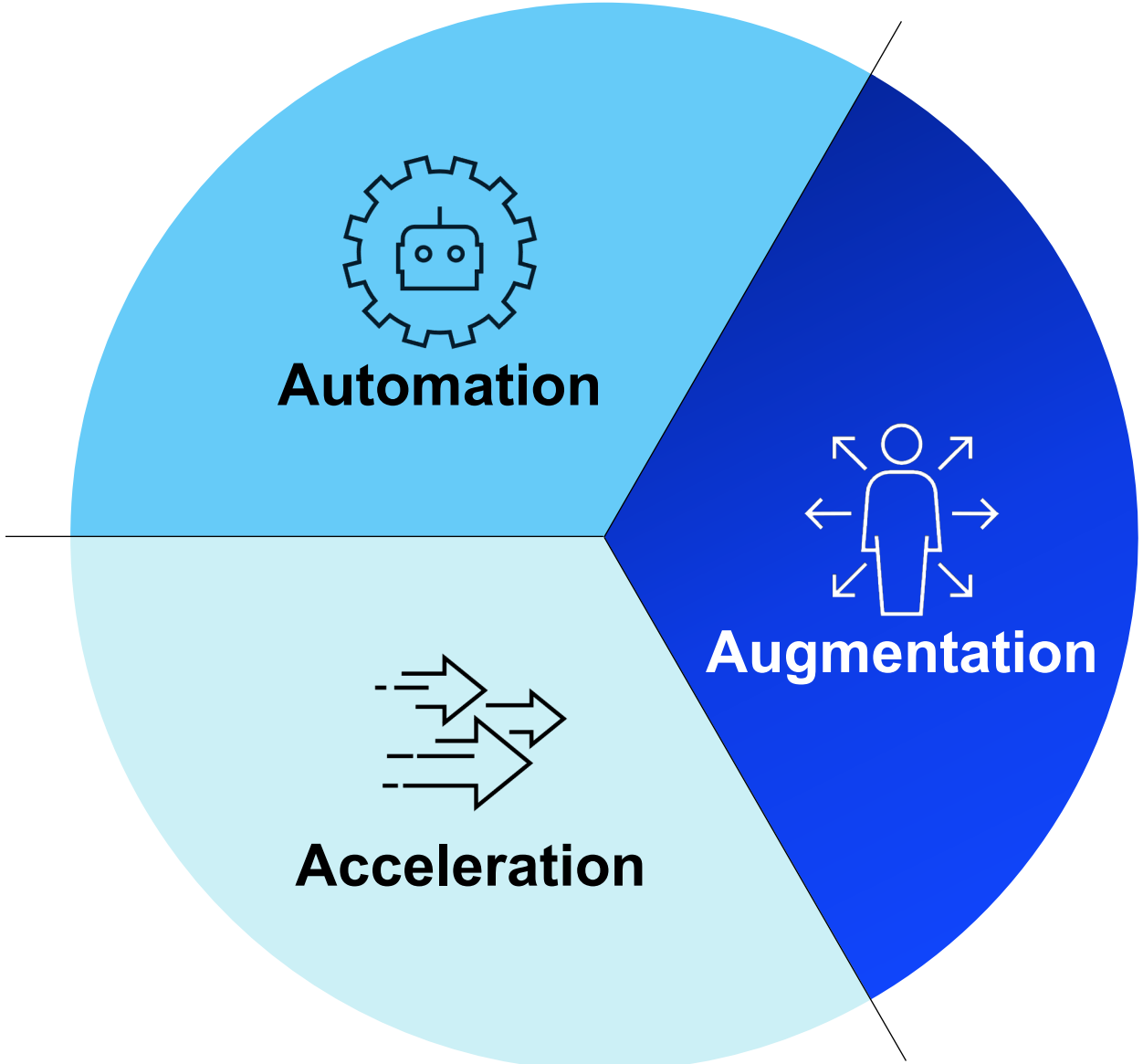
GenAI will lead to three kinds of impact, leading to reinvention of major processes worldwide



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Generative AI is well suited to several applications in the construction process but not well suited for others

Applications suited for GenAI

Generating content

Predicting or extracting information

Applications NOT suited for GenAI

High-stakes scenarios

Applications involving heavy volume of requests and/or tight response time limits

Unconstrained, long, open-ended generation

Applications requiring explainability and/or full understanding of potential failure modes

Applications requiring numerical reasoning (from basic arithmetic to optimization)[1]

1. Current topic of research: how to use GPT-like models to generate code that involves solving numerical problems

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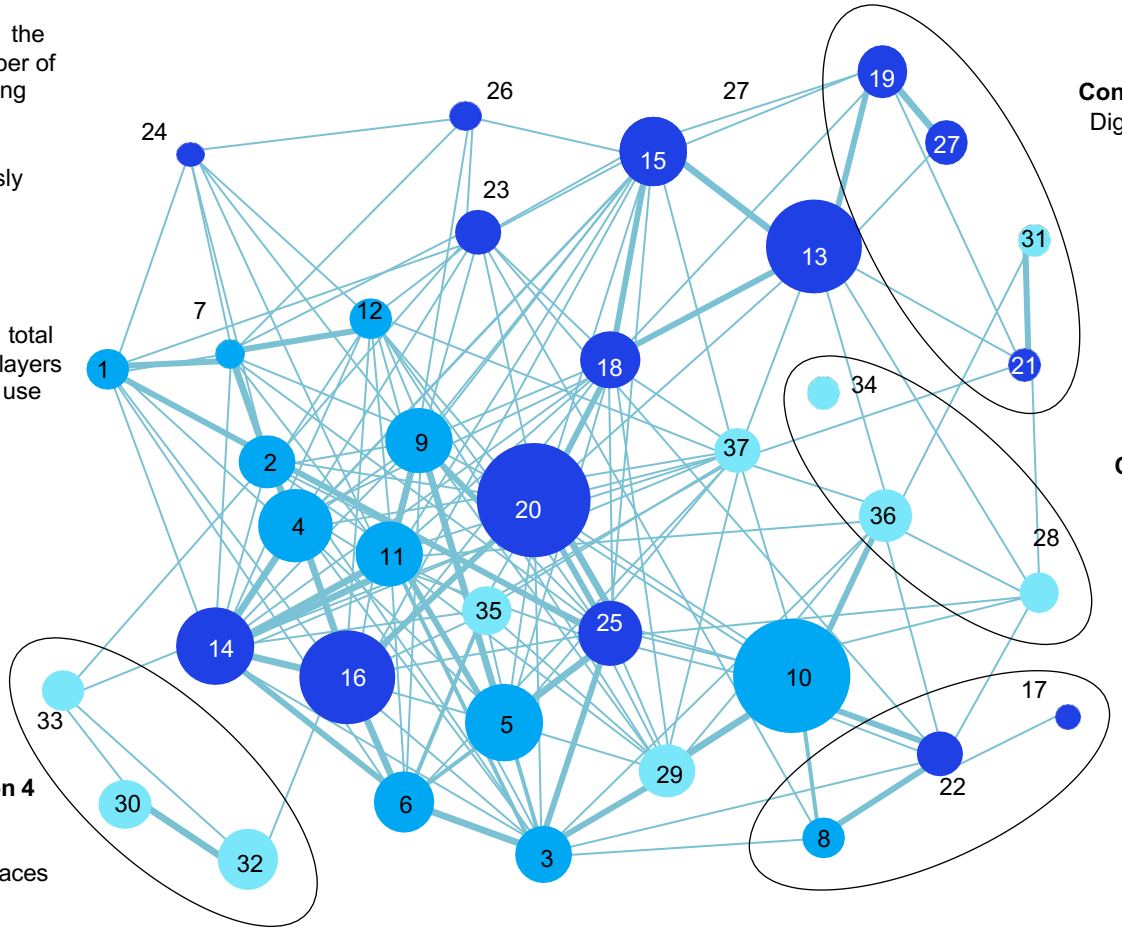
What are the most promising applications of AI in the Construction Technology ecosystem?

Construction technology industry map[1]

Thickness of the lines = number of players offering connected use cases simultaneously

Circle size = total number of players offering that use case



Constellation 1
Digital twins

Constellation 2
3D printing, modularization, and robotics

Constellation 4
Supply-chain optimization and marketplaces

Digital collaboration

1. Capital financing
2. Customer relationship management
3. Equipment management
4. Estimating
5. Manpower optimization
6. Materials management
7. Portfolio planning and management
8. Predictive assessment performance
9. Project scheduling
10. Real-time monitoring and control
11. Resource planning
12. Risk management

Back office

13. 3-D modeling
14. Bidding process
15. Building-information modeling
16. Contract management
17. Deep learning
18. Design management
19. Design simulation
20. Document management
21. Laser scanning
22. Machine learning
23. Process simulation
24. Productivity management
25. Progress tracking and performance dashboards
26. Value engineering
27. Virtual learning

On-site execution

28. 3-D printing
29. Compliance
30. Construction materials marketplace
31. Drone-enabled yard inspection
32. Equipment marketplace
33. Labor and professional marketplace
34. Off-site fabrication
35. Quality control
36. Robotics/ automation
37. Testing and training

Source: Pitchbook; Preqin; McKinsey analysis

What is likely to hold back the use of AI in construction?

Customer fragmentation

“This is a risk-averse and fragmented sector at its core, so growth is slow, but it is extremely sticky.”

Multiple personas

“The most successful companies have a plan to sell to the enterprise, not just the project.”

Industry economics

“In today’s environment you have to clearly demonstrate and measure the cost-saving benefits of your product.”

Adoption / scaling barriers

“The pandemic forced us to accelerate adoption from the office to the site overnight”

Will the industry have the same difficulty scaling AI as for other Construction Tech?

Top-5 highest impact barriers to profitable growth in AEC tech[1],
% of respondents marked as most impactful

Product fragmentation — **52%** of respondents

Focus on engineering vs product/market fit — **48%** of respondents

Lack of access to customers — **39%** of respondents

Gaps in core tech — **37%** of respondents

Lack of resources in marketing sales — **37%** of respondents

1. AEC = architecture, engineering, and construction. Question: What are the most impactful barriers to profitable growth in construction tech?

Source: McKinsey survey of 104 AEC tech investors and operators, 2022

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