

Real Applications and Solutions using AI in the A/E/C Industry

Moderator: Candice Scale, HDR

Speakers:

- Michael Ramos, President, Raymond

May 15, 2024, 10:30 a.m.



 **conferences i/o**



or browse to
jetc.cnf.io

This is an interactive session.
To participate, use your mobile device:
jetc.cnf.io
Or scan the QR Code

- Find the session.
- The presenter will unlock the poll(s) during the presentation.
- Please complete a brief Evaluation Survey at the end of the session.

MAY 14-16, 2024
ORLANDO, FL

OPERATION:
COLLABORATION

SAME [SAMEJETC.ORG](https://samejetc.org)

HOUSEKEEPING ITEMS

Take Note of Exits

Silence Your Mobile Devices

Presentations and Audio Recordings will be available in the Attendee Service Center until August 30, 2024

Download your PDH record in the Attendee Service Center before August 30, 2024



Thank You to our Education Session Sponsors





MODERATOR



Candice Scale

HDR

Sr. Business Development Manager

Fun Facts

- Loves Mexican food
- Has been a SAME member since attending Georgia Southern
- Recruited Mike Ramos to be the Atlanta Post President
- Named one of the Top 50 Women Leaders in Georgia for 2024

MAY 14-16, 2024
ORLANDO, FL

OPERATION:
COLLABORATION

SAME SAMEJETC.ORG



SPEAKER



Michael Ramos
Raymond
President

Fun Facts

- Red Sox and Patriots fan from my time in Boston
- Can solve a 6x6 Rubix cube
- Favorite authors are Michael Crichton and Michael Lewis
- Celebrating his 10-year wedding anniversary next week, May 24th

MAY 14-16, 2024
ORLANDO, FL

OPERATION:
COLLABORATION

SAME SAMEJETC.ORG

Live Content Slide

Poll: Where do you fall in using AI today?

Learning Objectives

This course will meet the following learning objectives:

1. Potential considerations related to Cybersecurity and Government regulations for AI implementations.
2. How to leverage AI for improved marketing and proposal development use cases.
3. Potential real-world AI use cases for the A/E/C industry and state of the industry today.
4. Customization of AI applications AI and future use cases for the A/E/C industry.

Disclaimer: I used AI a lot to build this presentation.



20
24

JOINT ENGINEER
TRAINING CONFERENCE
& EXPO

SAMEJETC.ORG



[@SAMENATIONAL](https://www.facebook.com/SAMENATIONAL)



[@SAME_NATIONAL](https://twitter.com/SAME_NATIONAL)



[#SAMEJETC24](https://twitter.com/SAMEJETC24)

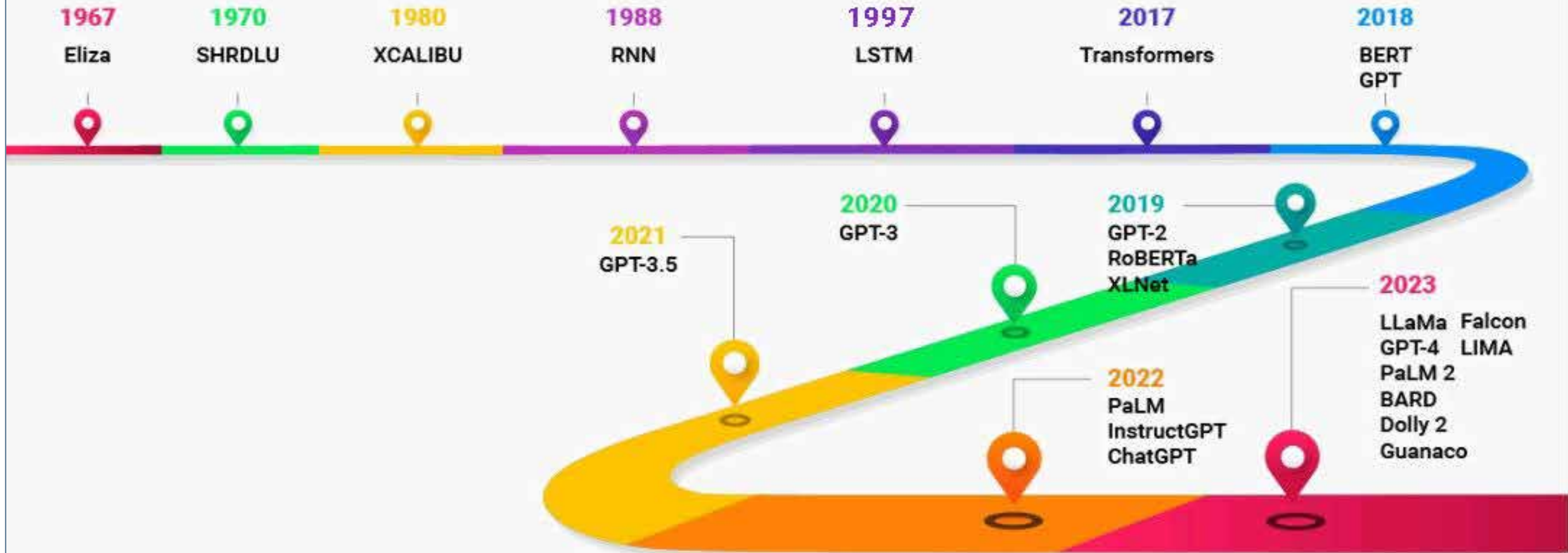


["SOCIETY OF AMERICAN MILITARY ENGINEERS"](https://www.linkedin.com/company/society-of-american-military-engineers)

“AI, or Artificial Intelligence, refers to the development of computer systems that can perform tasks that typically require human intelligence. These tasks include learning, reasoning, problem-solving, perception, understanding natural language, and speech recognition. The goal of AI is to create machines that can mimic or simulate human cognitive abilities.”



Evolution of Large Language Models



<https://www.analyticsvidhya.com/blog/2023/07/build-your-own-large-language-models/>

The Current Market Leader

ChatGPT is a large language model-based chatbot developed by OpenAI and launched on November 30, 2022.

It is notable for enabling users to refine and steer a conversation towards a desired length, format, style, level of detail, and language used. Successive prompts and replies, known as prompt engineering, are considered at each stage of the conversation as a context.

ChatGPT is trained on a massive dataset of text and code, including books, articles, code, and conversations. This allows it to generate text that is both informative and engaging.



OpenAI ChatGPT 4.0

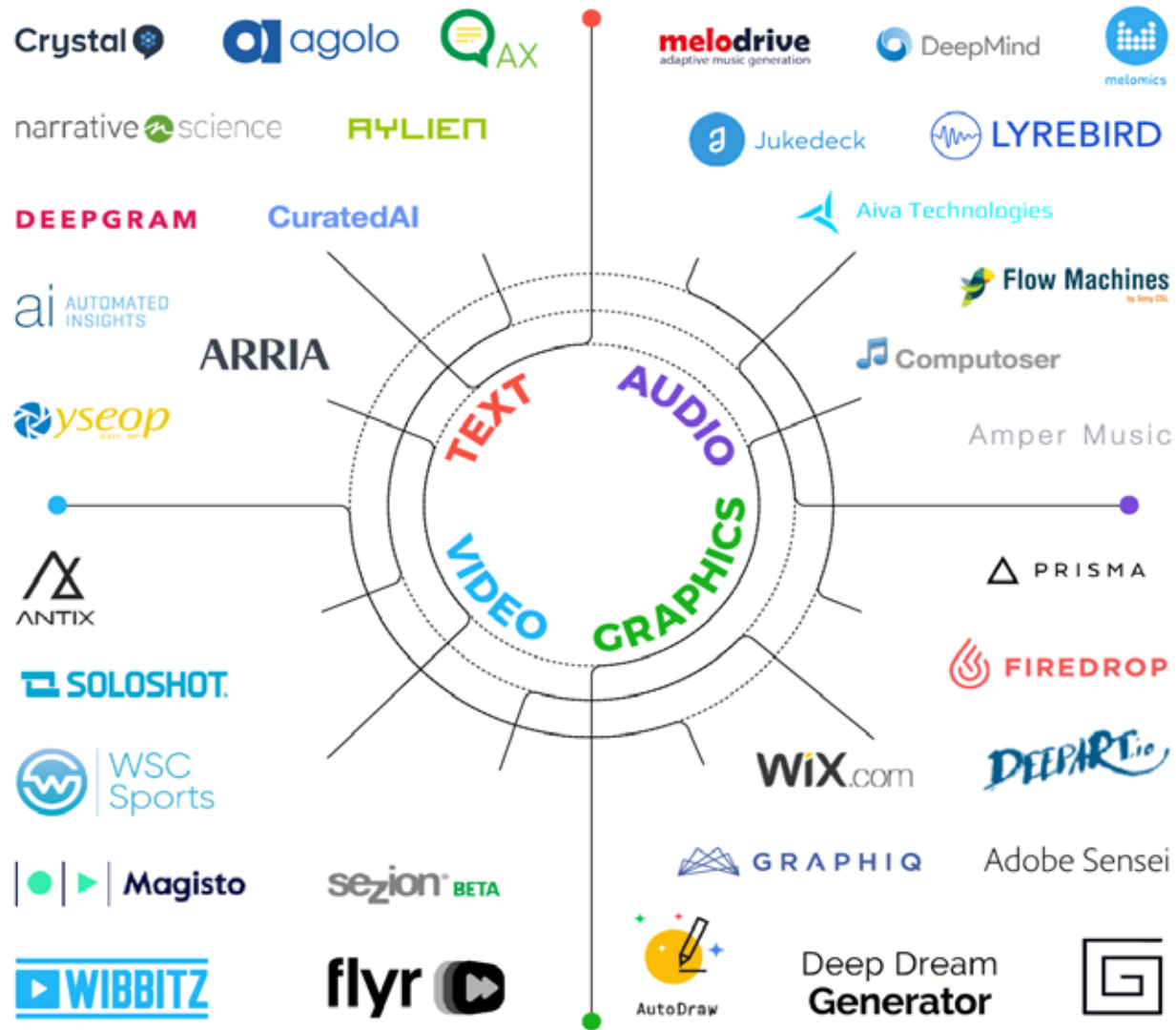
Key Facts

- OpenAI was founded in 2015
- Microsoft has invested over \$10,000,000,000 towards the development of ChatGPT
- GPT = Generative Pre-trained Transformer
- ChatGPT 4 uses 100 Trillion parameter (1 petabyte) vs. 175 Billion parameters (45 terabytes) for ChatGPT 3

The Growing AI Landscape



The Growing AI Landscape



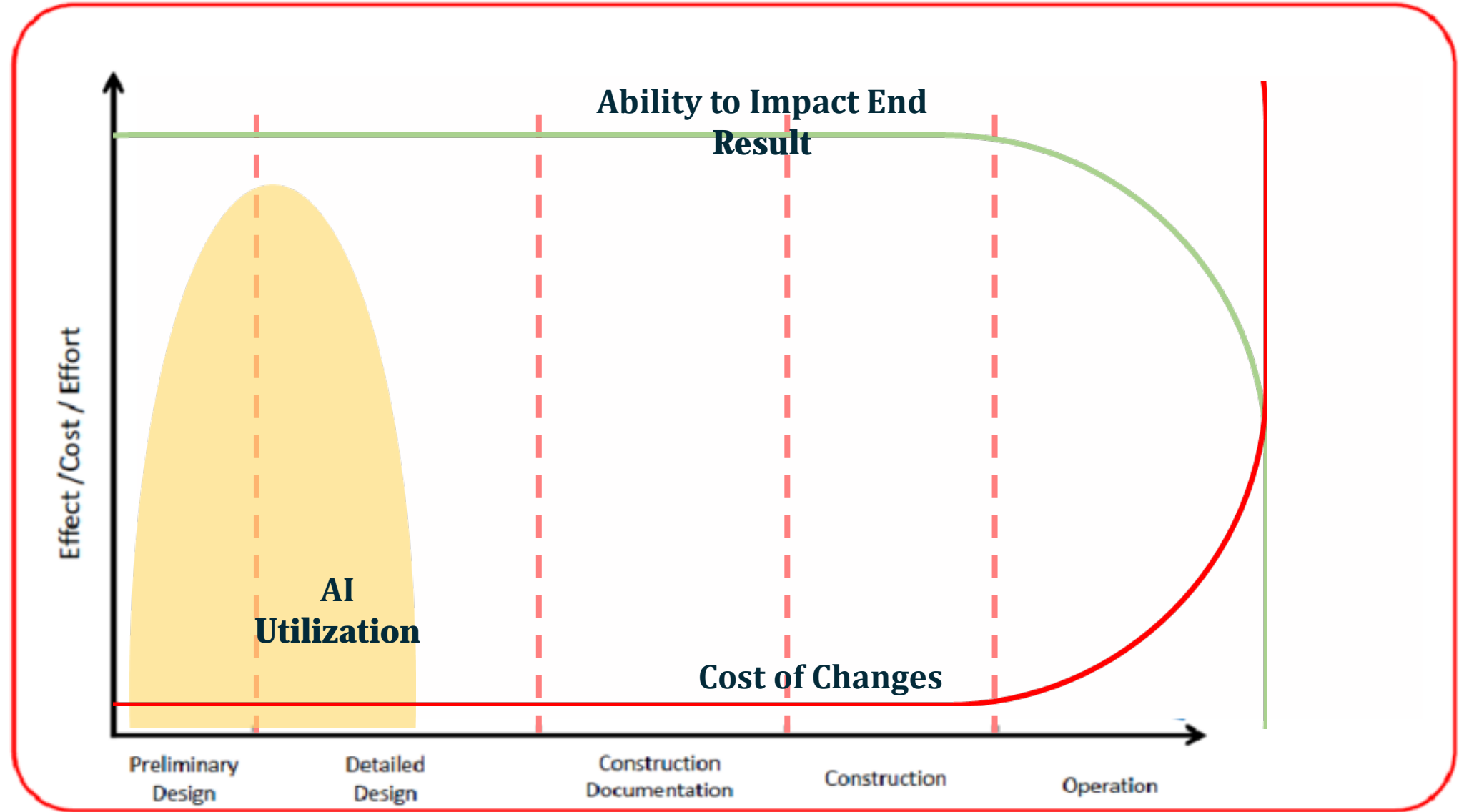
We're in the early phase of a massive expansion of AI services...

What does this mean for us?

- § New services coming online every month
- § Integration of AI into existing products
- § Potential to be more efficient at lower costs
- § Upcoming waves of hype for new technology
- § Great startups and products coming to market that never make it...
- § The scary potential that more work is created for us...

Why Do We Care About AI? – The Macleamy Curve

It c



OW

The Potential AI Impact – Marketing vs. Design vs. Construction



Marketing

Current Inefficiencies

- Writing resumes
- Writing project pages
- Topic-based, technical writing
- Statistic & fact lookups (“smart search”)
- Improved personnel photos
- Improved project photos



Design

Current Inefficiencies

- Determining user perspective in design charrettes
- Conceptual design development and user buy-in
- BIM creation
- Engineering calculations
- Code review and permitting



Construction

Current Inefficiencies

- Bid generation
- Site setup / surveying
- Construction progress monitoring
- Repetitive, manual tasks
- Existing condition inspections
- Report writing

Cyber Security + Government Regulations



2024

JOINT ENGINEER
TRAINING CONFERENCE
& EXPO

SAMEJETC.ORG



[@PSAMENATIONAL](https://www.facebook.com/PSAMENATIONAL)



[@PSAME_NATIONAL](https://twitter.com/PSAME_NATIONAL) | [#SAMEJETC24](https://twitter.com/SAMEJETC24)



["SOCIETY OF AMERICAN MILITARY ENGINEERS"](https://www.linkedin.com/company/society-of-american-military-engineers)

Understanding Data Security – How AI Models Operate

Technically, we could build an infinite number of models because every model can be developed to perform different use cases, leveraging different data sets or data types. Its important to understand the role of data and how it is being used relative to new and existing AI models

Key Definitions

Training Model

An AI model that is actively being trained on a set of data at the current point in time.

Data set to this model can (and likely will) be incorporated into the existing, and growing, training data set.

Key Consideration: Any data sent for use by the model may be permanently retained by the host company and/or the model, leaving you with no control over the data that you've sent.

Live Model

An AI model that has already completed training on a specified data set and is not undergoing additional training.

While data sent to it does not inform (train) how the model works in the future, there is still a chance that the host company can retain the data you send to it, even if the model itself is not retaining it in real time.

Key Consideration: Understand the host company's data privacy and retention policies and whether they plan to retain, use, or train on that data at a future date.

Understanding Data Security – How AI Models Operate



“The suit does not include an exact monetary demand. But it says the defendants should be held responsible for “billions of dollars in statutory and actual damages” related to the “unlawful copying and use of The Times’s uniquely valuable works.” It also calls for the companies to destroy any chatbot models and training data that use copyrighted material from The Times.”

Grynbaum, Michael and Mac, Ryan. “The Times Sues OpenAI and Microsoft Over A.I. Use of Copyrighted Work.” *New York Times*, 27 December 2023

According to OpenAI, the New York Times had to specifically query ChatGPT (“red teaming”) to discover that their data was being used by the AI model.

The problem? There’s no easy way to know if your data is being used by an AI model or not.

Understanding Data Security – How AI Models Operate

Relevant Executive Orders:

- E.O. 14110 – Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence (October 30, 2023)
- E.O. 13960 – Promoting the Use of Trustworthy Artificial Intelligence in the Federal Government (12/8/2020)



Safe and Effective Systems



Algorithmic Discrimination Protections



Data Privacy



Notice and Explanation



Human Alternatives, Consideration, and Fallback

Why Do Regulations Matter?

Any regulation ever created aims to keep people safe.
So, can we assume that Artificial Intelligence safe?



20
24

JOINT ENGINEER
TRAINING CONFERENCE
& EXPO

SAMEJETC.ORG



@SAMENATIONAL



@SAME_NATIONAL | #SAMEJETC24



"SOCIETY OF AMERICAN MILITARY ENGINEERS"

Why Do Regulations Matter?

ai hallucination

noun

an incorrect or misleading results that AI models generate

They can be caused by a variety of factors, including:

- Insufficient training data
- Incorrect assumptions made by the model
- Biases in the data used to train the model
- A model's limited contextual understanding
- The inherent noise or errors in the training data

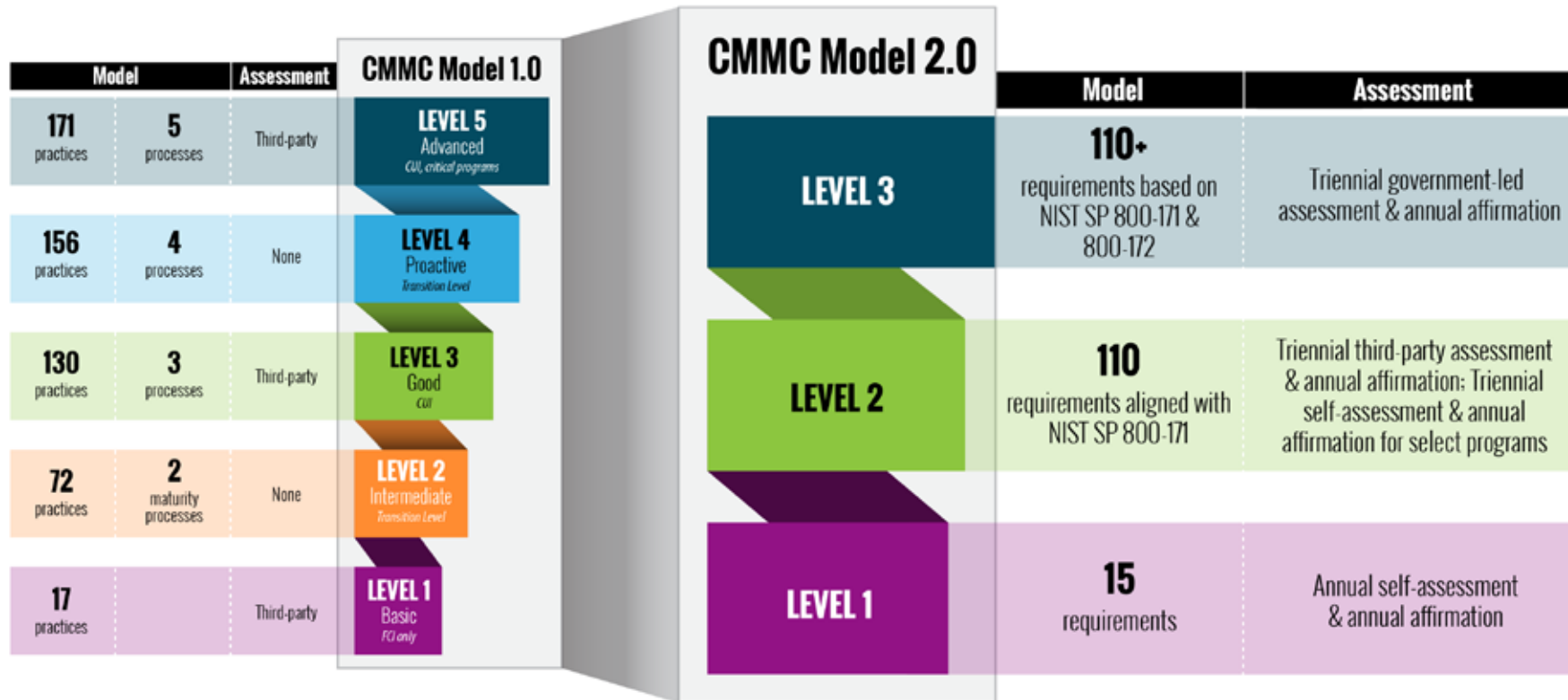
“Early this how Maha resistance



<https://missouriindependent.com/2024/02/13/missouri-appeals-court-fines-litigant-after-finding-fake-ai-generated-cases-cited-in-filings/>
<https://www.theguardian.com/world/2024/feb/29/canada-lawyer-chatgpt-fake-cases-ai>
<https://www.npr.org/2023/12/30/1222273745/michael-cohen-ai-fake-legal-cases>

Understanding Data Security

With CMMC, the Department of Defense is putting in place aggressive contractor compliance measures that mimic data access/protection controls similar to how classified data is handled, but for unclassified information



Depending on the Level that your company requires, data may require sandboxing or other secure access controls.

For DoD data, then would naturally preclude being allowed to use a training AI model on the data, as you will lose control over what happens to and/or where the data is stored

However, an interesting AI use case is using AI to write your compliance



Is there a workaround? If we can't send data, what do we do?

Deploy AI behind your firewall, so your data isn't being sent anywhere...
If I can't send data to the available tools, what can I do?



2024

JOINT ENGINEER
TRAINING CONFERENCE
& EXPO

SAMEJETC.ORG



@SAMENATIONAL



@SAME_NATIONAL



#SAMEJETC24



"SOCIETY OF AMERICAN MILITARY ENGINEERS"

Live Content Slide

Poll: What type of organization do you work for?

Marketing & Proposals



2024

JOINT ENGINEER
TRAINING CONFERENCE
& EXPO

SAMEJETC.ORG



[@PSAMENATIONAL](https://www.facebook.com/PSAMENATIONAL)



[@PSAME_NATIONAL](https://twitter.com/PSAME_NATIONAL) | [#SAMEJETC24](https://twitter.com/SAMEJETC24)



["SOCIETY OF AMERICAN MILITARY ENGINEERS"](https://www.linkedin.com/company/society-of-american-military-engineers)

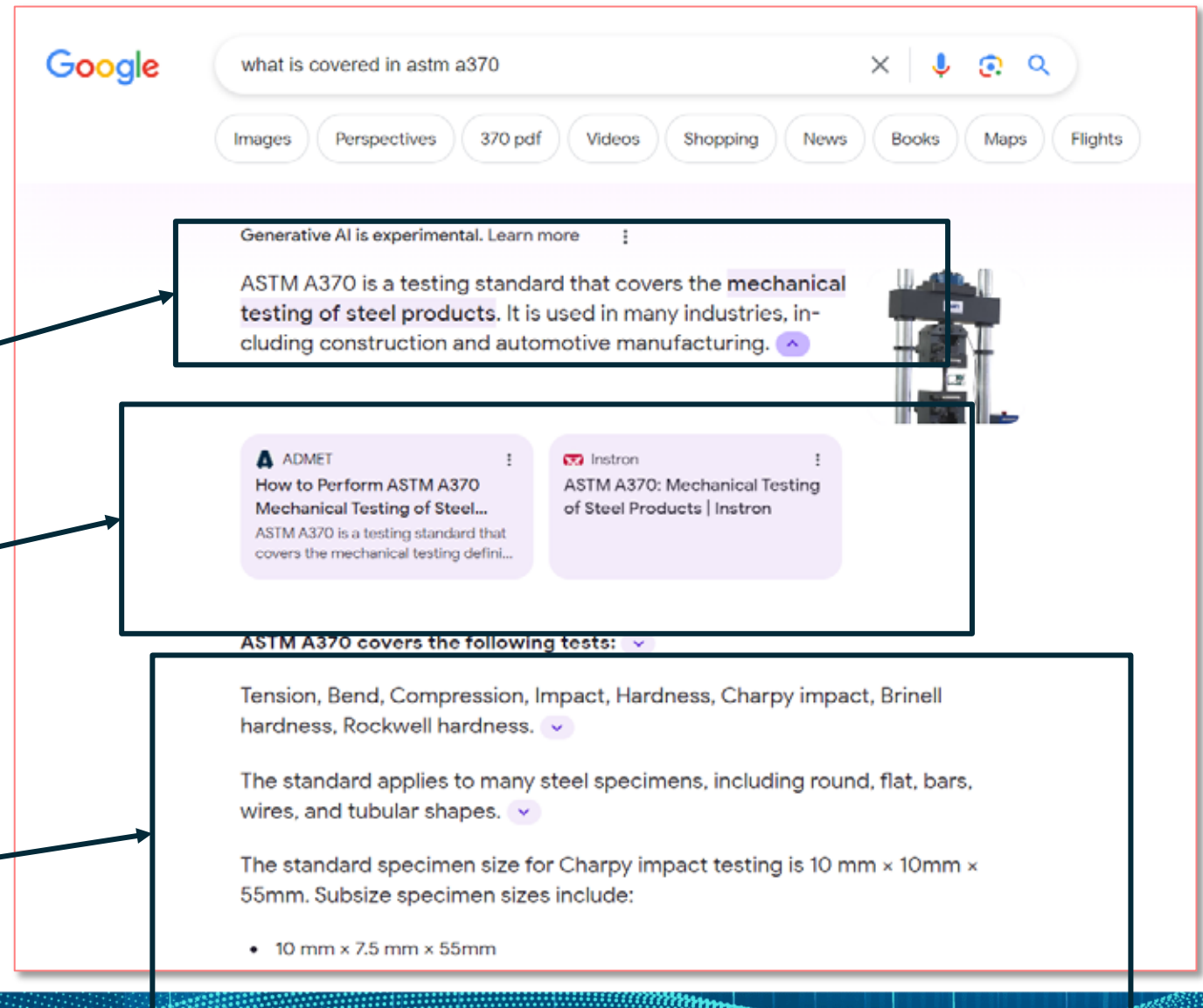
Smarter Research – Leveraging AI in Search Engines

Using tools like Google Lab's built in experimental AI search (leveraging Bard and Gemini) is excellent for technical research

Initial AI-generated smart topic summary

Direct references for the summary write-up, allowing for fact checking

Greater depth of summary with more technical information – all with reference as-needed

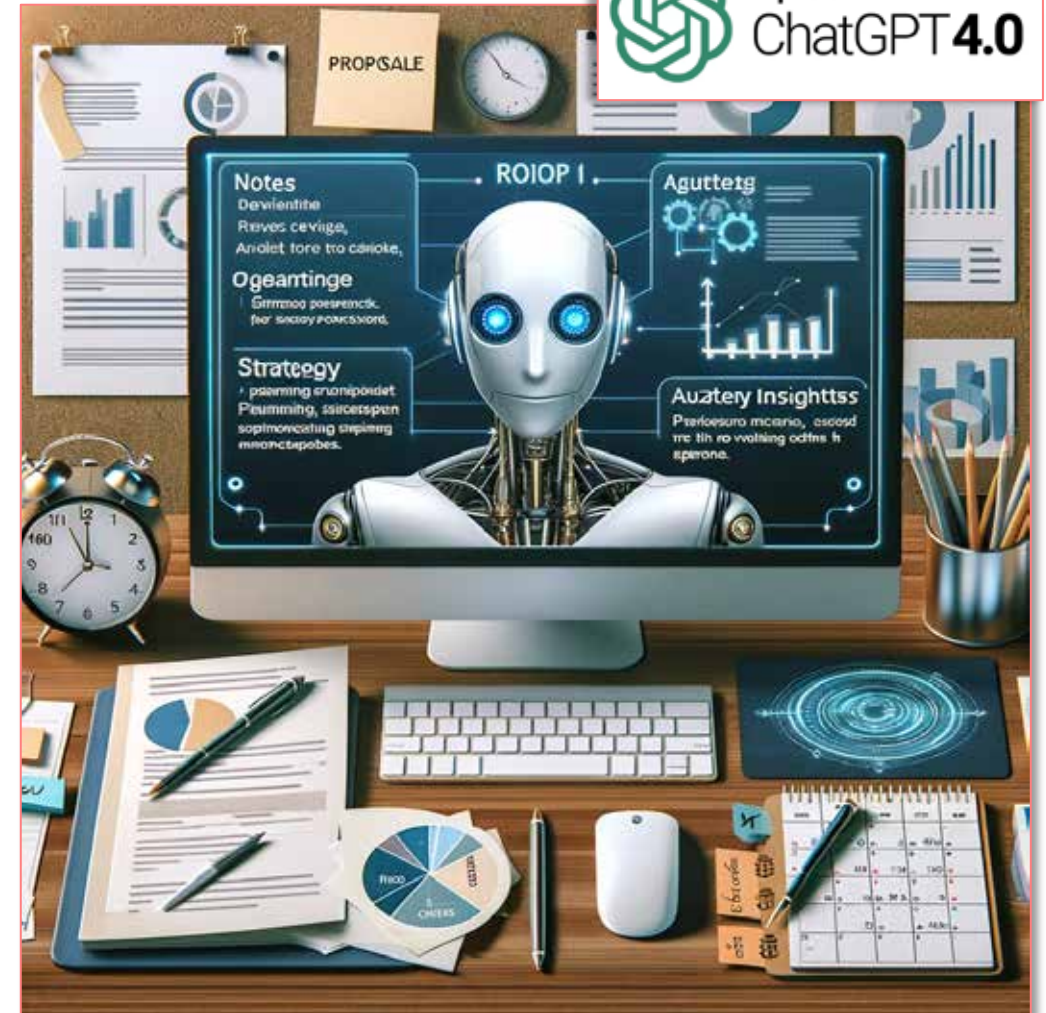


Smarter Research – Leveraging AI in Search Engines

Given that Marketing Coordinators are typically trained “on-the-job” on technical aspects of the industry, AI presents strong *potential* to help with topic-based technical writing.

Ideal Use Cases Today Include:

1. **Idea generation and brainstorming** – providing ideas and approaches for how one might write up a topic or answer an RFP/RFQ question
2. **Research assistance** – compiling background information, statistics, and data to help in writing a strong section
3. **Editing and proofreading** – third-party writing reviews
4. **Answering specific RFQ/RFP questions** – generative AI for drafting new content
5. **Customization and personalization** – tailoring writing through the use of user direction and suggestions



“The value ChatGPT can provide a proposal writer”

Rapid Image Altering – Using Photos of Existing Conditions



Rockdale County

Courthouse Renovation & Addition Project

- Original building built in 1939
- Has significant deterioration
- Numerous utilities located directly in front or adjacent to the property
- Bidding on the renovation of the existing facility

Rapid Image Altering – Using Photos of Existing Conditions



Rockdale County

Courthouse Renovation & Addition Project

- Adobe Firefly enables rapid photoshopping of bad site conditions
- Required less than 30 seconds to generate the new rendering, including learning how to do it
- Significant improvement by just removing the utilities, even if we don't do a complete photoshop

Improved Company Marketing – Headshot Generation



2017 Headshot



Improved Efficiencies – Internal AI Deployment



Cybersecurity compliant

- Deployed behind our firewall with no access to external sources
- Can train on our project data to be specific to our company



Content Generation

- Trained on our server and projects
- Formatted resume and project page generation on demand



*Open-source AI model that can be downloaded, trained, modified, improved, and **deployed** as you see fit*



Technical Writing

- Trained on our existing writing along with >10k technical documents
- Customized and industry-specific technical writing to answer specific RFQ/RFP questions on demand

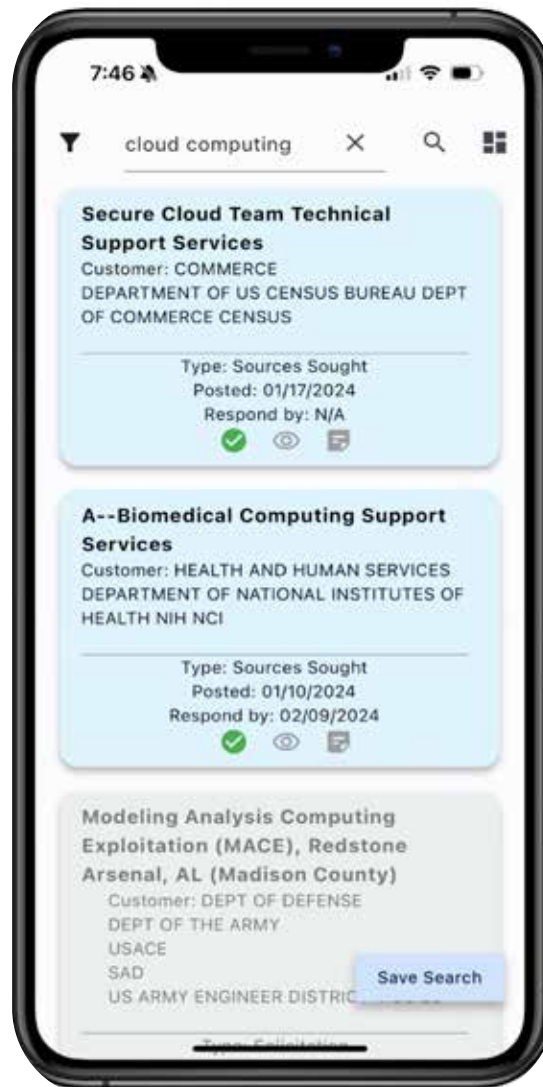
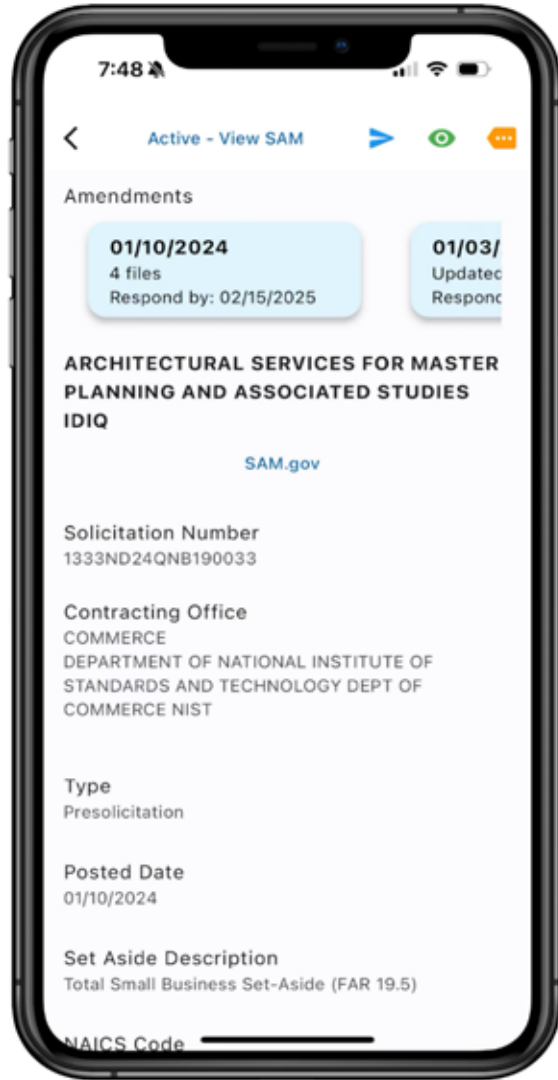


EXPERT

Automated Expert

- Trained on our existing projects
- Fast and reference information querying for rapid lookup of project-specific data

AI For Opportunity Searching – Finding the Right Targets



Getting started in innovation does not have to require building an AI platform first.

Today

- Built on Federal sourced databases
- Provides fast searching, tracking, and updates on federal solicitations

Tomorrow

- Building AI into the search process to match the user's interests and past performance / contracts to upcoming contracts
- Building AI into analysis of federal contract spend to identify which contracts are historically active and of interest to the user based on their preferences

Generative Design



2024

JOINT ENGINEER
TRAINING CONFERENCE
& EXPO

SAMEJETC.ORG



[@PSAMENATIONAL](https://www.facebook.com/PSAMENATIONAL)



[@PSAME_NATIONAL](https://twitter.com/PSAME_NATIONAL) | [#SAMEJETC24](https://twitter.com/SAMEJETC24)



["SOCIETY OF AMERICAN MILITARY ENGINEERS"](https://www.linkedin.com/company/society-of-american-military-engineers)

Imaging Design – Using ChatGPT + Dall-E 3

Let's say that you're starting a new design project and you're looking for design inspiration and want to try using AI to help you along. With that in mind, let's ask AI to generate ideas for this query:

"Imagine how a renovated office would look after being converted from an old warehouse"

Sure! Picture this:

As you step into the renovated office, the first thing that strikes you is the spaciousness and the industrial charm retained from its warehouse days. The high ceilings soar above you, supported by sturdy beams that have been lovingly restored to their former glory. Natural light floods the space through large windows that line the walls, offering expansive views of the surrounding area.

The layout is open and airy, with different work zones delineated by sleek, modern furniture and strategic placement of plants to add a touch of greenery. The exposed brick walls, once worn and weathered, now serve as a rustic backdrop for contemporary art pieces and motivational quotes.

In one corner, there's a cozy lounge area with plush sofas and bean bags, perfect for informal meetings or a quick brainstorming session. Nearby, a communal kitchen with state-of-the-art appliances invites employees to gather and socialize over coffee or lunch.

Throughout the office, you'll find nods to the building's industrial past, such as repurposed pallets transformed into stylish shelving units and pendant lights fashioned from reclaimed materials. Yet, alongside these industrial elements, modern amenities abound, including smart technology for climate control and energy efficiency.

Overall, the renovated office strikes the perfect balance between old and new, blending the character of its warehouse origins with the functionality and comfort required for a contemporary workspace. It's a place where creativity flourishes, collaboration thrives, and employees feel inspired to do their best work.

Imaging Design – Using ChatGPT + Dall-E 3

Imaging an initial concept is ideal for the DALL-E 3 algorithm, available via ChatGPT

One caveat – the AI is not ideal for taking an existing photo of the space and having the AI modify and update it for your design parameters.

Running our warehouse to office space query generates...



Successes

- Reasonably designs the stated request
- Easily understood that this is a warehouse being converted to an office space

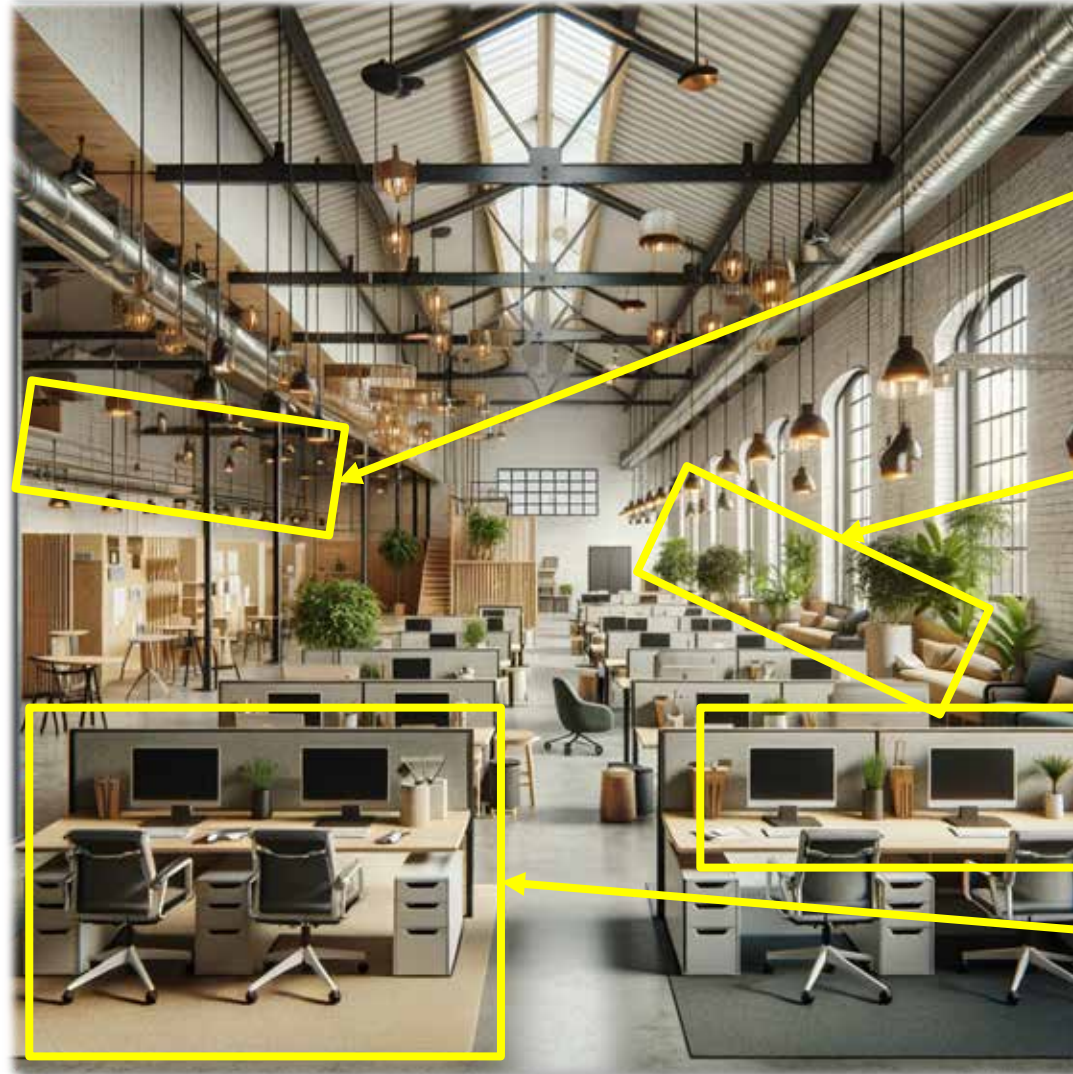
Limitations

- The shape, configuration, and features of the space are AI-directed rather than grounded in the reality of the site
- Maintains the AI “polish” of being more art than real

Imaging Design – Using ChatGPT + Dall-E 3

Building upon our warehouse to office space example, let's aim to further refine what the design could be down the road.

This time, let's ask the AI to integrate a photo of an existing work area into the design.



Stylistic changes to things like the 2nd floor railing

More alignment to picture's open work area configuration, as represented by the placement of lounge areas

Removed Macs and replaced with PCs

Workstations more aligned to the sample picture

Imaging Design – Using ChatGPT + Dall-E 3

Building upon our warehouse to office space example, let's aim to further refine what the design could be down the road.

This time, let's ask the AI to integrate a photo of an existing work area into the design.



And now asked to add lounge / conference space



Takeaways

- Give a vague description and you give AI too much design freedom to produce an idea for your project
- Developing a more accurate description of your desired space is doable, but you either cannot control every parameter or it will take significant time and tweaking to get right
- Very good today at generating design concepts

Imaging Design – Using ChatGPT + Dall-E 3

My quick ChatGPT query: “Draw an empty rectangular warehouse that uses a steel frame and columns. The heating and cooling should be metal and hanging from the ceiling. Use rectangle LED lights. Draw retractable bay doors on the back wall”



What I Aimed For



Design Charrettes – Using AI to Build Faster Consensus

Beyond design inspiration, design charrettes can create significant opportunities for individual stakeholders to push for requirements and/or features that others have different opinions on or that are poorly communicated to the design team (i.e., limiting understanding).

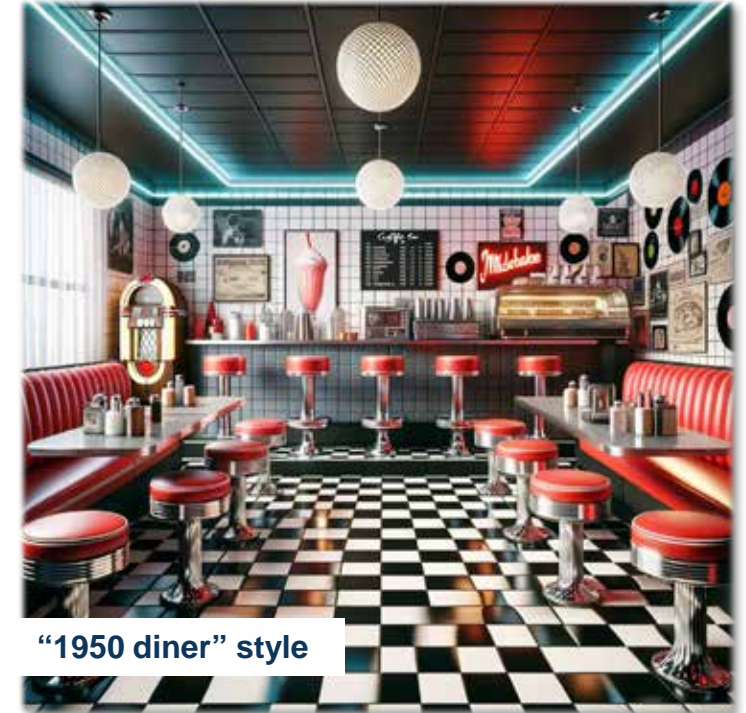
Let's say we're doing a "chic" coffee shop project...



"Starbucks" style



"21st century trendy" style



"1950 diner" style

Design Charrettes – Using AI to Build Faster Consensus



User Requirements

- More complex and high-profile projects tend to have significant time spent trying to determine what the individual users want
- We are aiming to build an AI system that extracts and visualizes the user's desired end state prior to the design charrette



Negotiated Design Concept

- Even if we know the desired end state for an individual, we still need to negotiate across the entire stakeholder group
- We are aiming to build an AI system that can efficiently combine multiple design requirements into a single negotiated project concept



Concept-to-BIM Generation

- Once the design concept is agreed upon, we still need to build the Revit (BIM) model
- We are aiming to build an AI conversion process that translates the design concept into the initial BIM model

Accelerating Design – AI-Assisted Modeling

ARCHITEChTURES®



ARCHITEChTURES uses proprietary Generative AI technology to obtain for each iteration and in real-time, the solution that best suits the geometry, objectives and design criteria entered. This enables the designer to have full control over the quantitative aspects of the design to focus on decision-making and improve the design's added value.

HYPAR

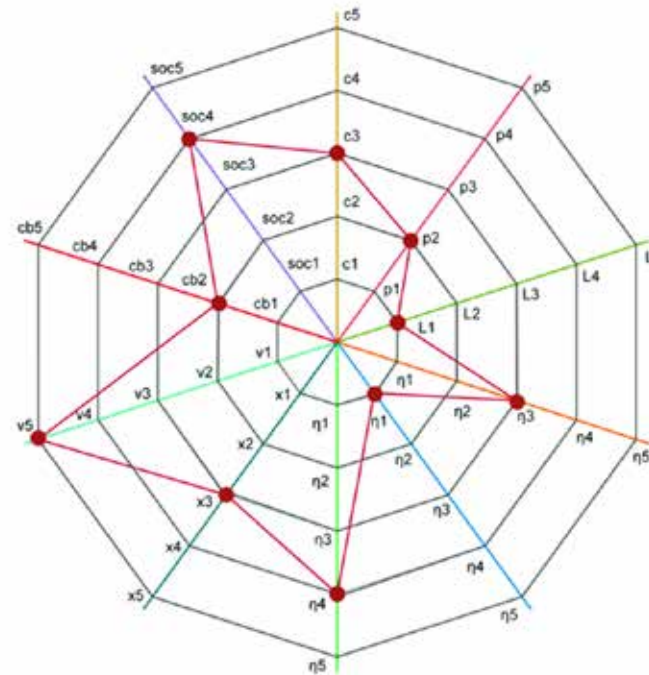
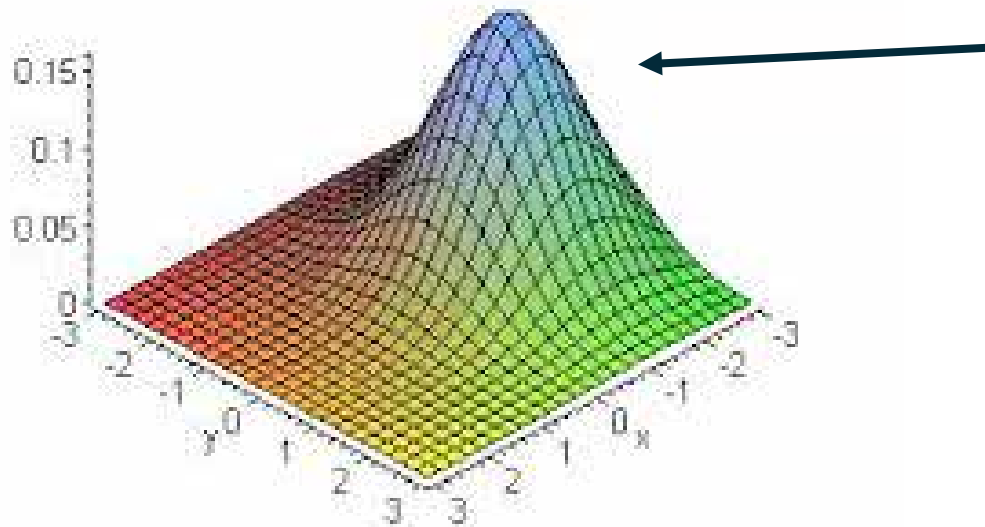


Hypar is a design automation platform for buildings. It allows users to create and share design logic, and publish, distribute, and maintain it. Hypar offers sector-specific applications, such as a workplace planning solution. Hypar has a UI that doesn't require large data sets. It includes an AI that allows users to describe a building and turn it into text.

Engineering Optimization – Advanced Scenario Modeling

Using AI to optimize Engineering calculations presents significant potential for time savings in design, especially when customer design changes come late in a project...

The goal would be to model multiple parameters and variables simultaneously, mapping millions of potential scenarios. Thereby, giving the Engineering team the ability to select the optimal design scenario to dig into, explore, and validate.



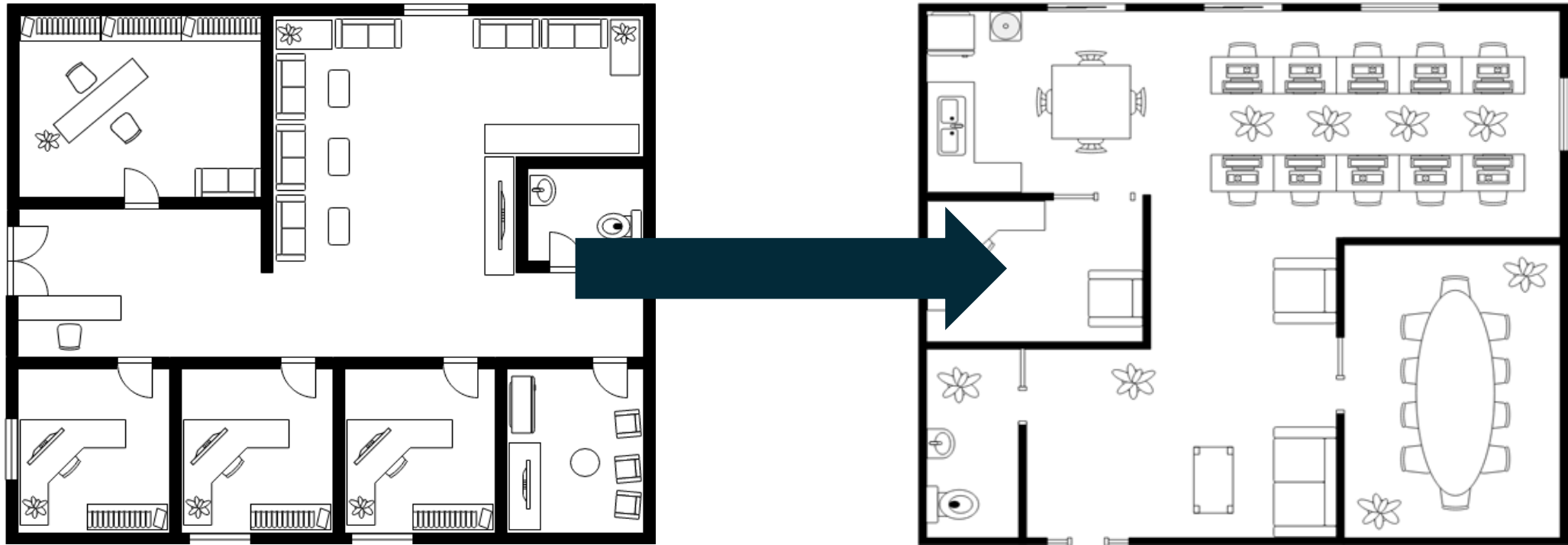
For any design scenario, being able to pull the initial calculation parameters and variables based on the AI model's initial calculations.

AI is not intended to replace licensure.

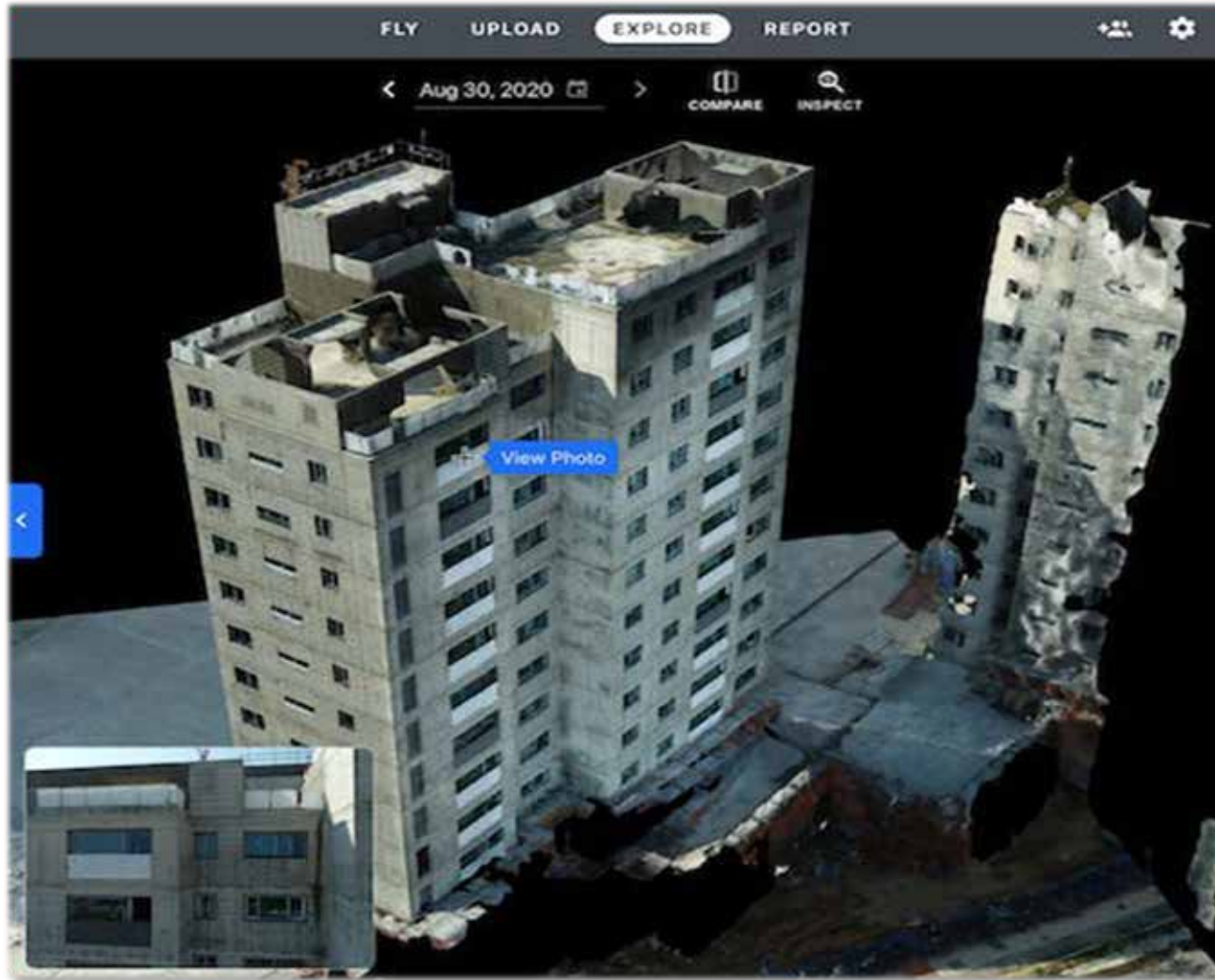
Engineering Optimization – Advanced Scenario Modeling

Using AI to optimize Engineering calculations presents significant potential for time savings in design, especially when customer design changes come late in a project...

The other goal is that when the architectural design changes, late in design, that we're not 100% back to the beginning of Engineering's work



Three-Dimensional Rendering – Building Facades



Multi-Story Façade Inspections

New software does allow for the same three-dimensional rendering of the full building structure, like how roofing and walls rendering works (previously discussed).

A key consideration is that this type of image processing is usually offered as an added feature by these software platforms.

Can enable better tracking of defects and issues found during the inspection.

Three-Dimensional Platforms – Options for Mapping & Defects



Autonomous Mapping

- Drone Manufacturer
- Especially popular for original drone models focused on recreational applications and user tracking (e.g., following the user while running, skiing, climbing, etc.)
- More recently focused on autonomous flight operations with applications for automated mapping 3D spaces



AI + Image Processing

- Software-as-a-Service (SaaS) company that can process drone imagery to identify façade defects automatically.
- Leverages a trained image recognition model for identifying defects
- Currently building for scale in the cloud
- Pricing is based on cost per square meters and provides subscription asset management
- In-house engineering team provides quality assurance



AI + Image Processing

- Software-as-a-Service (SaaS) company that can process drone imagery to identify façade defects automatically.
- Leverages a trained image recognition model for identifying defects
- Spin-out startup from Thornton Thomasetti
- Pricing is based on cost per square meters
- In-house engineering team provides quality assurance

Report Generation – Leveraging Digital Data + AI



Key Features

- Web-enabled
- Runs completely off our Google Firebase data storage system
- Easy-to-use
- Faster field data collection
- Can generated standardized reports

Report Generation – Leveraging Digital Data + AI

AI Generated Text for Fire Station #9 (BETA)

PLEASE CONTACT WITH FEEDBACK

Executive Summary ⓘ

GENERATE EXECUTIVE SUMMARY

SAVE GROUP

ADD DEFECT IDENTIFICATION #

A
B
C

Recommendations ⓘ

GENERATE RECOMMENDATIONS

Defect Type
 Action Urgency (Repair Required versus Monitor or Preventative Maintenance)

Topic-Based Writing ⓘ

TOPIC-BASED WRITING

SAVE INFO

Ability to generate custom Executive Summaries

The User can simply generate a single write-up

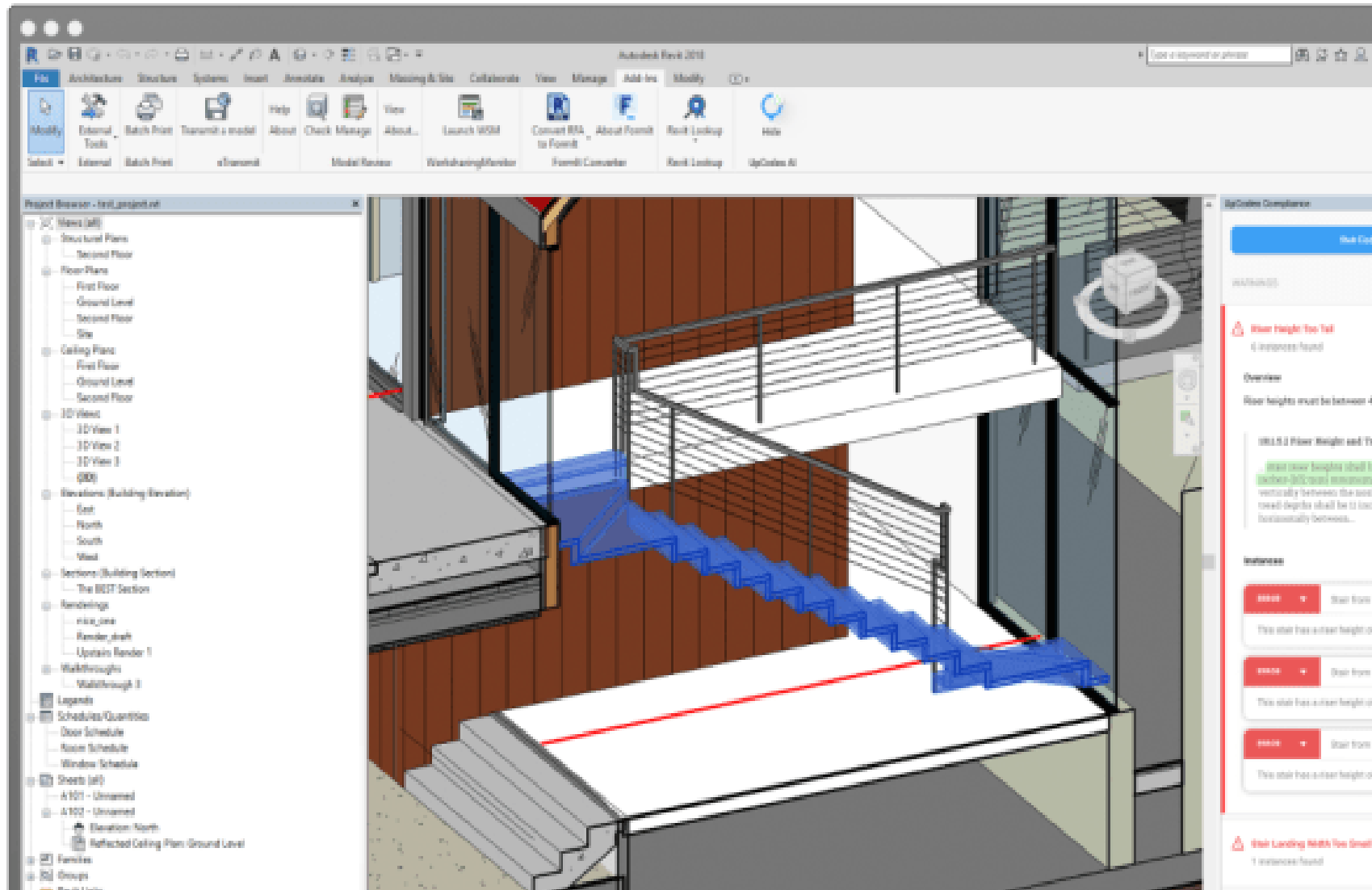
The User can choose to group specific areas together that are known to have similarity

The User can choose to generate Recommendations by either the Defect Type or the Defect Action Urgency

Defect Type still consolidates write-ups, while Action Urgency is based on when defects have been marked as higher severity or for repair

The User can ask ChatGPT to write on a specific topic that is need as part of the final report write-up

Code Compliance – Analysis for Permitting



Codecomply
www.codecomply.ai



Founders: Patrick Hughes,
Michael Sheehan, Patrick E.
Murphy, Matthew Foley

Codecomply.AI focuses on a two-pronged approach: helping architects, contractors, developers, and permit expeditures to submit plans that are fully compliant, and equipping building departments with the tools to review these plans more swiftly and effectively. Receive real-time feedback during design. Developed w/Togal.AI.

AI + Construction



2024

JOINT ENGINEER
TRAINING CONFERENCE
& EXPO

SAMEJETC.ORG



[@PSAMENATIONAL](https://www.facebook.com/PSAMENATIONAL)



[@PSAME_NATIONAL](https://twitter.com/PSAME_NATIONAL) | [#SAMEJETC24](https://twitter.com/SAMEJETC24)



["SOCIETY OF AMERICAN MILITARY ENGINEERS"](https://www.linkedin.com/company/society-of-american-military-engineers)

Thinking About Construction – Where Does AI Fit In?



Accelerating Estimating – Analysis for Construction

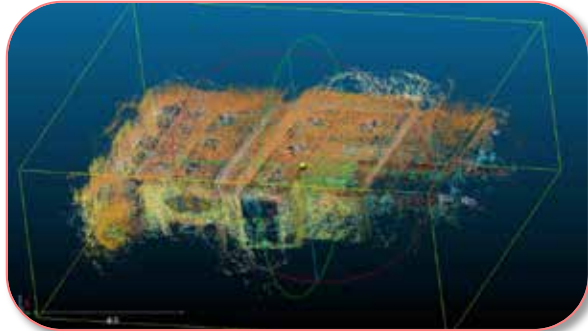


The AI-powered pre-construction software helping estimators win more bids and win more business. Automatically detect, measure, compare and label project spaces and features on architectural plans and drawings in seconds. This includes identify architectural features, measure spaces, capture linear measures for materials, and splitting an area into two sections.



Workorder integrates with estimating software and progress tracking tools for seamless data flows throughout the project life cycle. Once takeoffs are complete, pass data to other applications and eliminate redundant data entry.

Progress Monitoring – Data Capture



Drone & LIDAR Based Mapping of Construction Sites

Constructn is an automated construction monitoring solution that enables asset owners, contractors, and project managers to have complete, accurate, measurable, and accessible insights into the construction site. Constructn consumes data from multiple sources such as drones, 360 cameras, Laser scanners, and LiDAR to capture progress.



Rapid Cataloging of Progress by Date & Location

StructionSite is a platform that helps construction professionals document and track jobsite progress, with photos organized by date and floor plan. It allows users to capture photos, videos, and 360-degree documentation of their jobsites. StructionSite's AI-powered algorithms place 360-degree videos on the project drawing.



AI Processing for Site to BIM Matching

OpenSpace provides AI-powered analytics and reality capture tools for builders. OpenSpace's features include: 360° photo documentation, site capture, and analytics. Use AI-powered analytics to help with progress, work-in-place verification, coordination, and risk reduction.

Site Robotics – Scaling Repetitive Tasks



okibo

www.okibo.com

Founders: Guy German, Nadav Shuruk

Okibo's robots use 3D scanning to map their environment and can cross rough terrain. They also have advanced computer vision, laser detectors, geo-positioning, and inertial motion sensors. Okibo's robots can operate with workers on a construction site and are designed to replace manual labor and limited machinery.

Manufacturing – Scaling Repetitive Tasks



BotBuilt

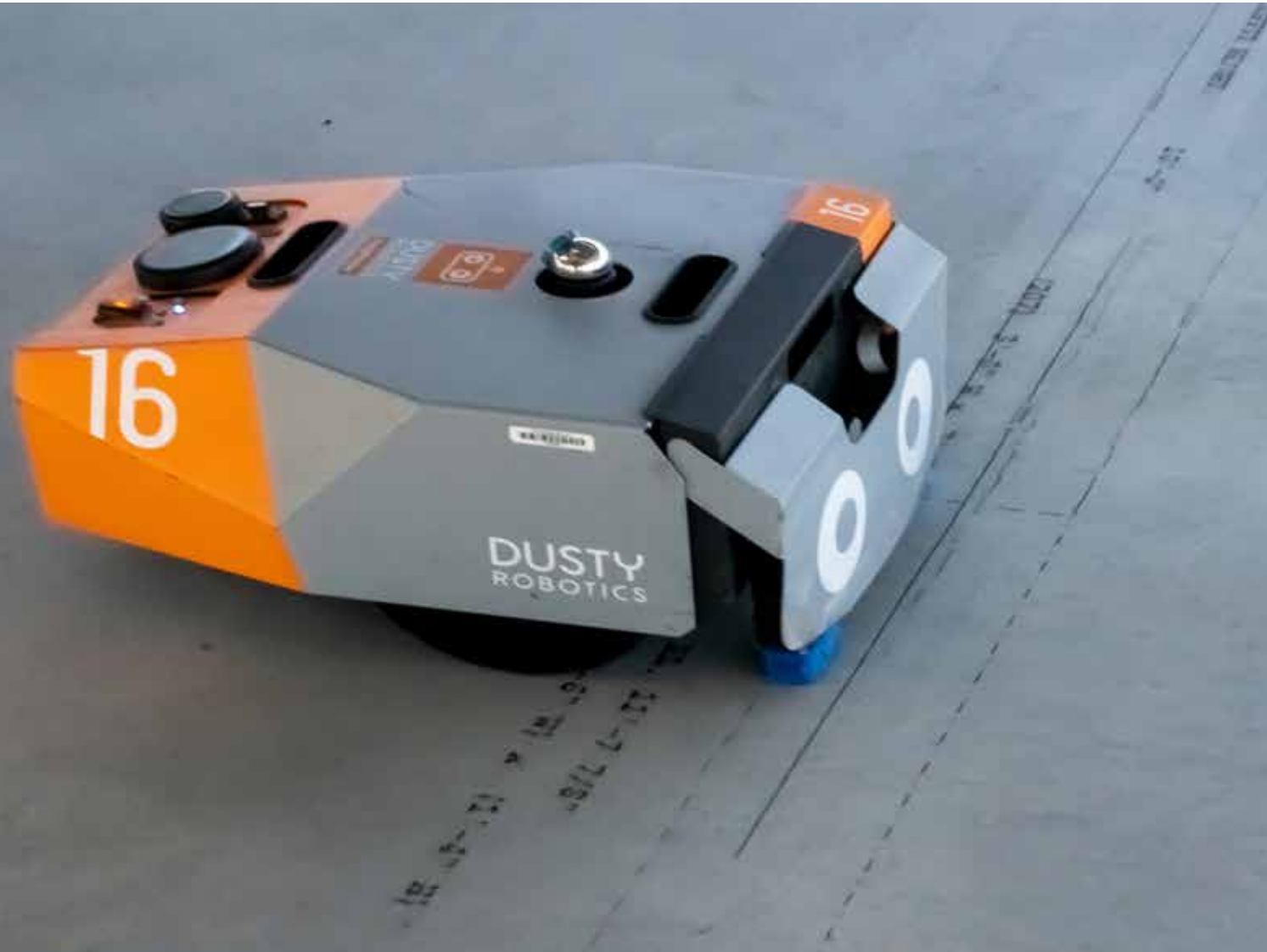
BotBuilt

www.botbuilt.com

Founders: Barnett Ames, Colin Devine, Brent Wadas

BotBuilt uses robotics to build homes. BotBuilt's process involves digitizing a plan with software; building a house to exact specifications; delivering components to the site ready for assembly; automating the framing step. The process allows for more efficiency on the actual construction job site.

Site Robotics – Scaling Repetitive Tasks



Dusty Robotics

www.dustryrobotics.com

Founders: Tessa Lau, Philipp Herget

Dusty Robotics is a company that develops robot-powered tools including flagship product FieldPrinter, a device that automates construction layout.

The FieldPrinter can: transfer a digital model directly to the construction site floor with 1/16" accuracy and print layouts for all trades in a single pass.

Site Robotics – Scaling Repetitive Tasks



Built Robotics

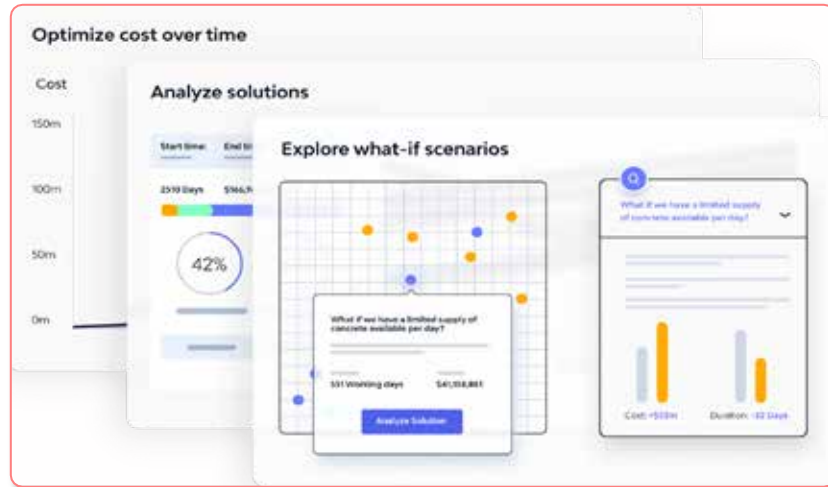
www.builtrobotics.com

Founders: Noah Ready-Campbell, Andrew Liang

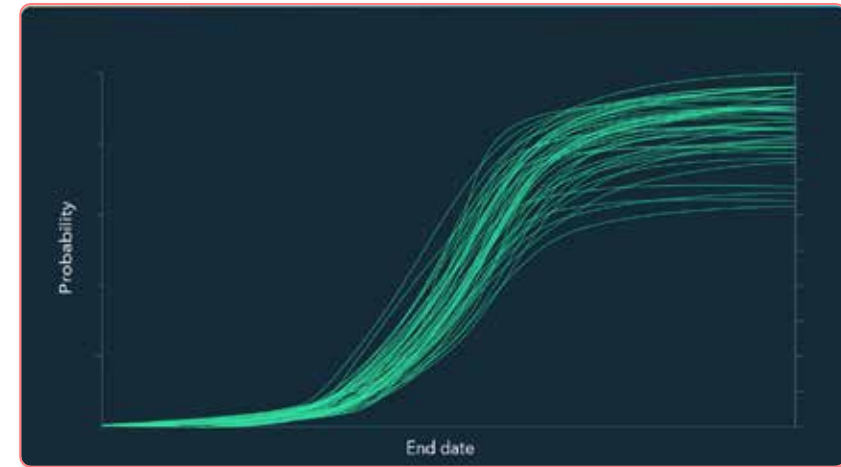
Built Robotics hardware and software to automate construction equipment. Their goal is to create robots that can transform heavy equipment into autonomous machines. Built Robotics' products automate repetitive tasks in the solar industry. Built Robotics' aftermarket kits allow users to bring full machine autonomy to bulldozers and excavators.



Optimized Project Planning – Risk + Scenario Planning



Rooted in generative construction, the **ALICE** platform gives scheduling and planning teams the horsepower to create and optimize schedules that traditional scheduling tools lack. The ALICE platform enables risk planning and mitigation through scenario-based analysis, allowing for better proactive and reactive management.



nPlan leverages an advanced simulation engine that can provide up-to-date schedule forecasts within moments, based on real data from the construction progress. nPlan leverages a combination of Monte Carlo simulations and Graph Neural Networks for its schedule and risk analysis.

Conclusions



2024

JOINT ENGINEER
TRAINING CONFERENCE
& EXPO

SAMEJETC.ORG



[@PSAMENATIONAL](https://www.facebook.com/PSAMENATIONAL)



[@PSAME_NATIONAL](https://twitter.com/PSAME_NATIONAL) | [#SAMEJETC24](https://twitter.com/SAMEJETC24)



["SOCIETY OF AMERICAN MILITARY ENGINEERS"](https://www.linkedin.com/company/society-of-american-military-engineers)

Live Content Slide

Poll: Where do you think AI is heading for A/E/C?

Considerations & Takeaways

Long-Term
[10+ Years]

Near-Term
[2-5 Years]

- Experimenting with new AI products and how they can exist in your workflows

- Potential for early adopter cost savings through improved efficiencies
- Lots of new products will come out during this period – some will make it, some will not

Mid-Term
[5-10 Years]

- AI Platforms will likely take hold, with more integrated complexity, functionality, and power

- Cost savings and improved profitability will be variable – pricing *could* still keep your costs high
- Should increase overall productivity, even if profitability lags

AI-enabled productivity finally solves our labor gap (i.e., not enough skilled workers), while helping AEC profitability

Low-cost bidders start using AI to decimate the feasibility of profitability and the market loses talent, companies, and capacity

Considerations & Takeaways

Long-Term
[10+ Years]

Near-Term
[2-5 Years]

- Experimenting with new AI products and how they can exist in your workflows

- Potential for early adopter cost savings through improved efficiencies
- Lots of new products will come out during this period – some will make it, some will not

Mid-Term
[5-10 Years]

- AI Platforms will likely take hold, with more integrated complexity, functionality, and power

- Cost savings and improved profitability will be variable – pricing *could* still keep your costs high
- Should increase overall productivity, even if profitability lags

AI-enabled productivity enables us to change the AEC value proposition and we dramatically increase our value to our customers and provide exceptional service

AI enables so much more work that no gains are realized and we're beholden to the technology (e.g., email, BIM, etc.)

THANK YOU

Please take a few minutes to complete a short survey about this session. Your feedback will help us improve future programming for JETC.

 **conferences** i/o



or browse to
jetc.cnf.io

Real Applications and Solutions using AI in the A/E/C Industry

- Michael Ramos,
mike.ramos@raymondllc.com
- Candice Scale,
Candice.scale@hdrinc.com

Q&A

Understanding Data Security – How AI Models Operate



The AI Act classifies AI according to its risk:

- Unacceptable risk is prohibited (e.g. social scoring systems and manipulative AI).
- Most of the text addresses high-risk AI systems, which are regulated.
- A smaller section handles limited risk AI systems, subject to lighter transparency obligations: developers/deployers must ensure that end-users are aware that they are interacting with AI.
- Minimal risk is unregulated (including the majority of AI applications currently available on the EU single market as of 2021).

The majority of obligations fall on providers (developers) of high-risk AI systems.

- Those that intend to place on the market or put into service high-risk AI systems in the EU, regardless of whether they are based in the EU or a third country.
- And also third country providers where the high risk AI system's output is used in the EU.

Users are natural or legal persons that deploy an AI system in a professional capacity, not affected end-users.

- Users of high-risk AI systems have some obligations, though less than providers (developers).
- This applies to users located in the EU, and users where the AI's output is used in the EU.

General purpose AI (GPAI):

- All GPAI model providers must provide technical documentation, instructions for use, comply with the Copyright Directive, and publish a summary about the content used for training.
- Free and open licence GPAI model providers only need to comply with copyright and publish the training data summary, unless they present a systemic risk.
- All providers of GPAI models that present a systemic risk – open or closed – must also conduct model evaluations, adversarial testing, track and report serious incidents and ensure cybersecurity protections.

https://artificialintelligenceact.eu/wp-content/uploads/2024/01/AI-Act-Overview_24-01-2024.pdf