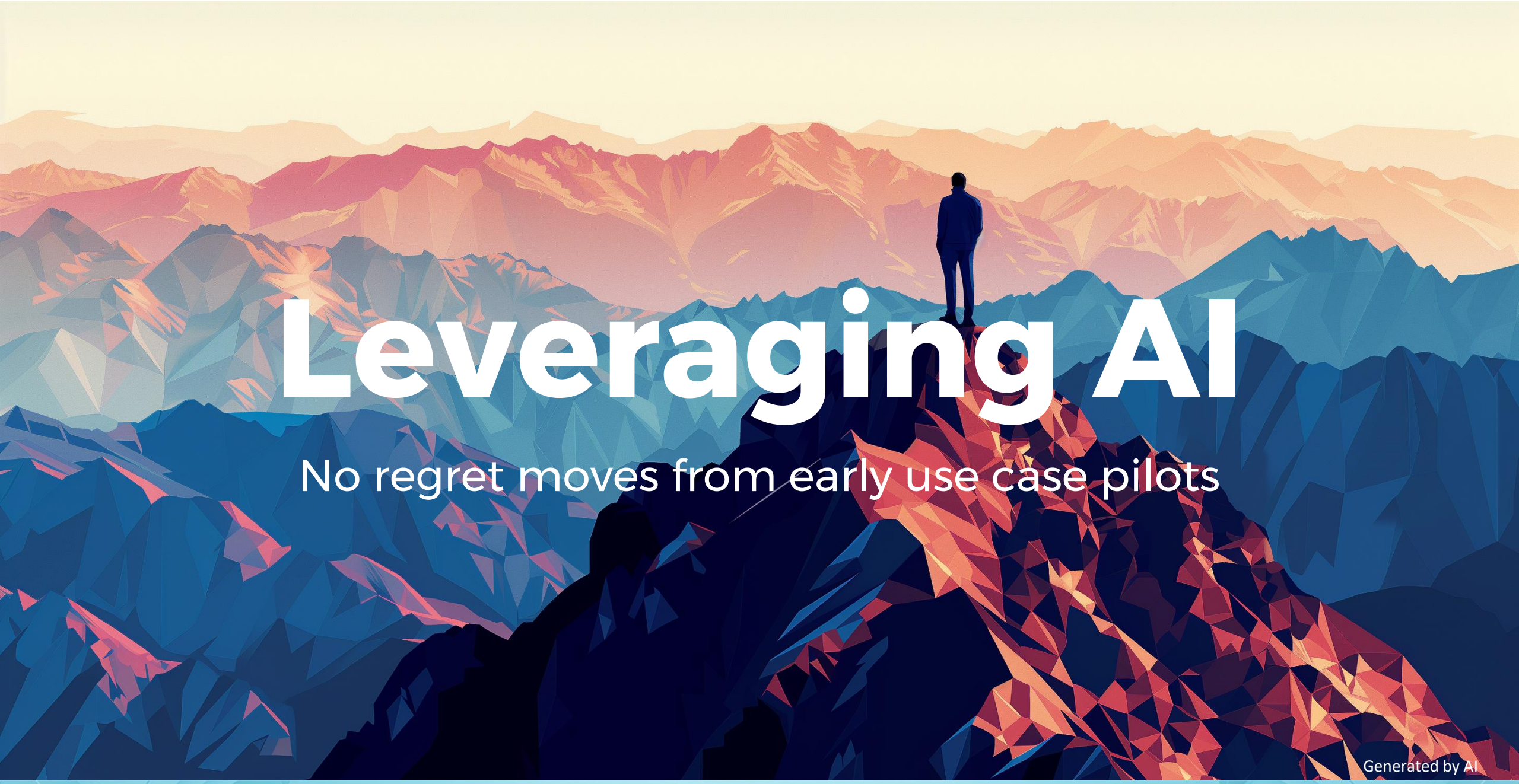
Leveraging AI

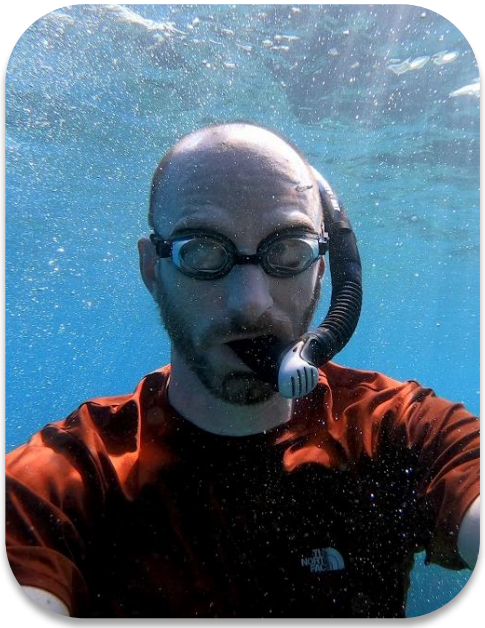
No regret moves from early use case pilots



Generated by AI

40th Annual FPC Seminar + Expo

Introductions



Jay Wratten
US Digital Lead
Boulder, Colorado

April Woods
Florida Building Systems Director
Orlando, Florida

Learning Objectives

Understand

Early AI use cases showing **business value** in application to AEC industry

Explain

The **impacts** AI is having on business as usual

Explore

New partnering models that leverage solution providers

Identify

No regret moves that can be applied to ongoing projects

TOPICS

1. Our approach to AI
2. Use Case proof of concepts
3. Partnering
4. No Regret Moves

Generated by AI

Our Approach to AI

1

Stay in our lane

Our expertise is in the built and natural environment.

It is not in selling software.

2

Add value at every step

Ensure that AI tools are providing clear value to our clients, employees, and shareholders.

Beware of shiny objects and pet projects.

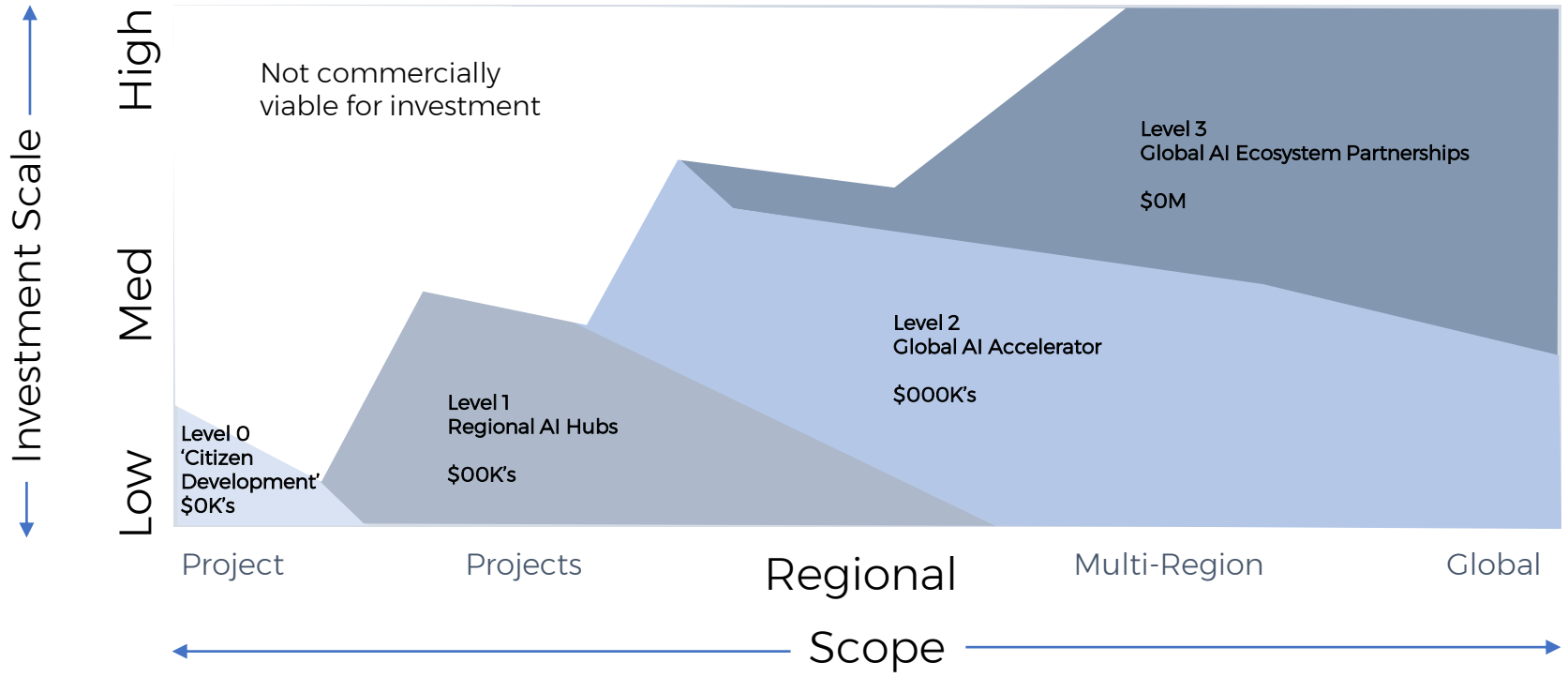
3

Don't get sued

Provide governance for use of AI, considering:

- Privacy & security
- Transparency
- Reliability & safety
- Fairness & Inclusiveness
- Accountability
- IP

Levels of Investment



Providers, Partners & Alliances

AUTODESK

Bentley

esri

slalom

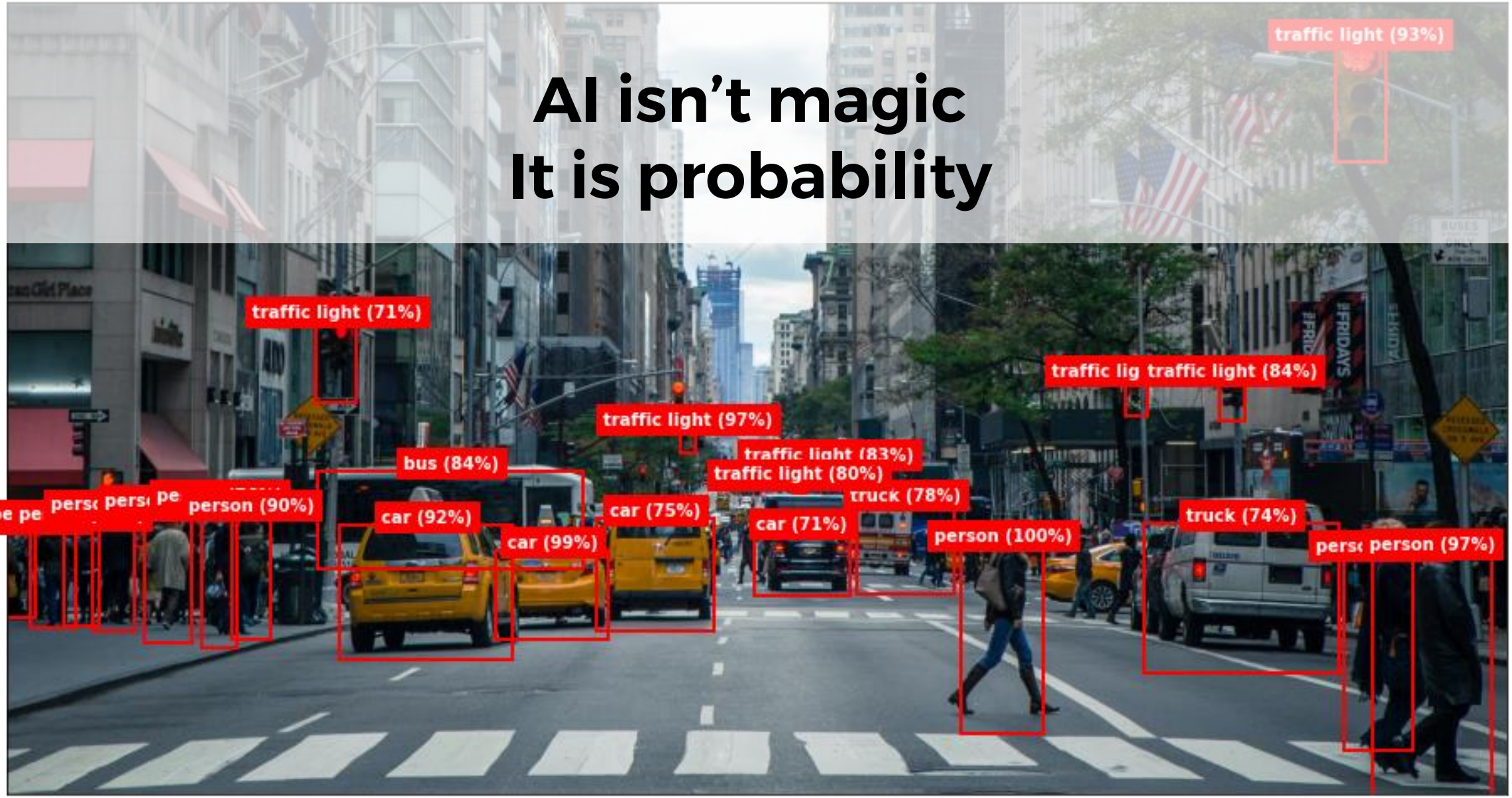
avanade

OpenAI

(future ambition)

Schneider Electric

AI isn't magic
It is probability



source: https://www.atmosera.com/blog/object-detection/

1956

Artificial Intelligence

The ability of machines to mimic human cognitive functions such as learning, reasoning, problem-solving, and decision-making through algorithms that enable complex data analysis and interpretation.

1997

Machine Learning

A subset of AI where algorithms learn from data without explicit programming, improving their performance over time through statistical patterns and iterative refinement.

2012

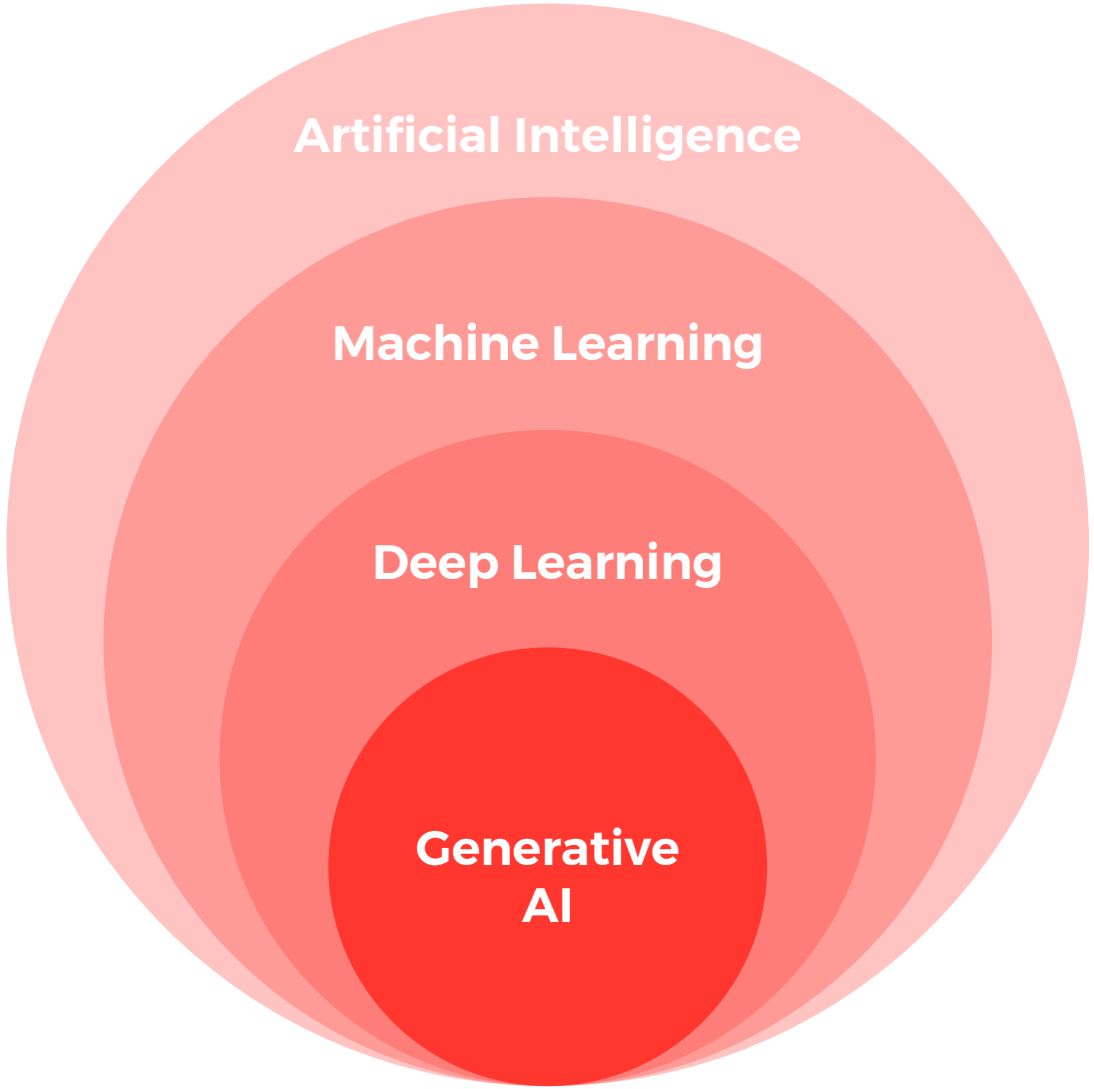
Deep Learning

A type of Machine Learning that uses artificial neural networks inspired by the human brain, capable of processing complex data like images and natural language.

2021

Generative AI

Large Language Models (LLMs) and image generation tools are a specific application of deep learning, trained on vast amounts of data, that can generate content based upon the input and prompts they receive from the user.



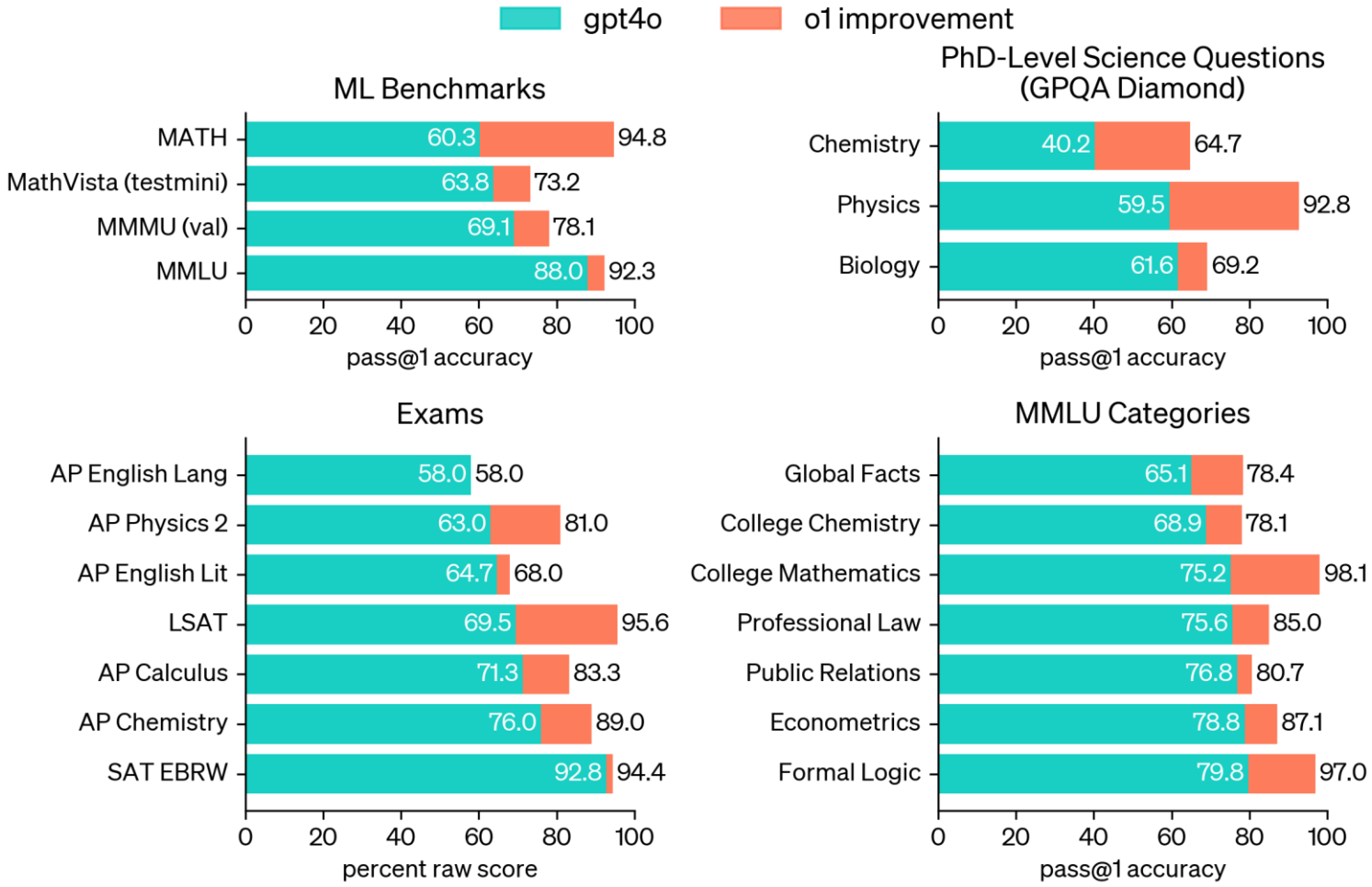
source: Microsoft

Recent Breakthroughs

2016	Object recognition *Human parity*
2017	Speech recognition *Human parity*
2018	Machine reading comprehension *Human parity*
2018	Machine translation *Human parity*
2019	Conversational Q&A *Human parity*
2020	Image captioning *Human parity*
2021	Natural Language Understanding *Human parity*
2021	Commonsense Question Answering *Human parity*
2022	ChatGPT
2023	GPT-4
2023	2023 GPT-4 Turbo, GPT-4 Turbo w/ Vision
2024	GPT-4o instant voice response

source: Microsoft

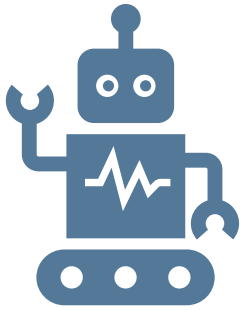
Rapid Advancement



source: OpenAI

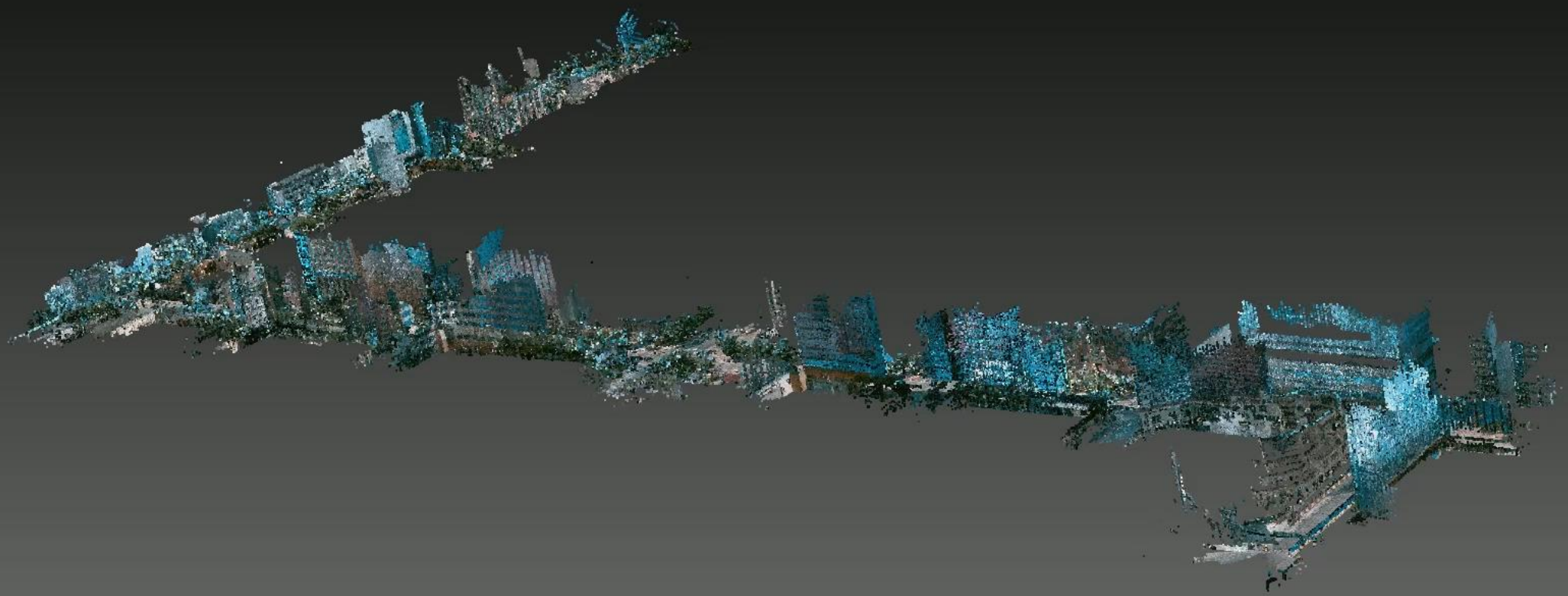
Use Case Categories

Find



Analyze

Create

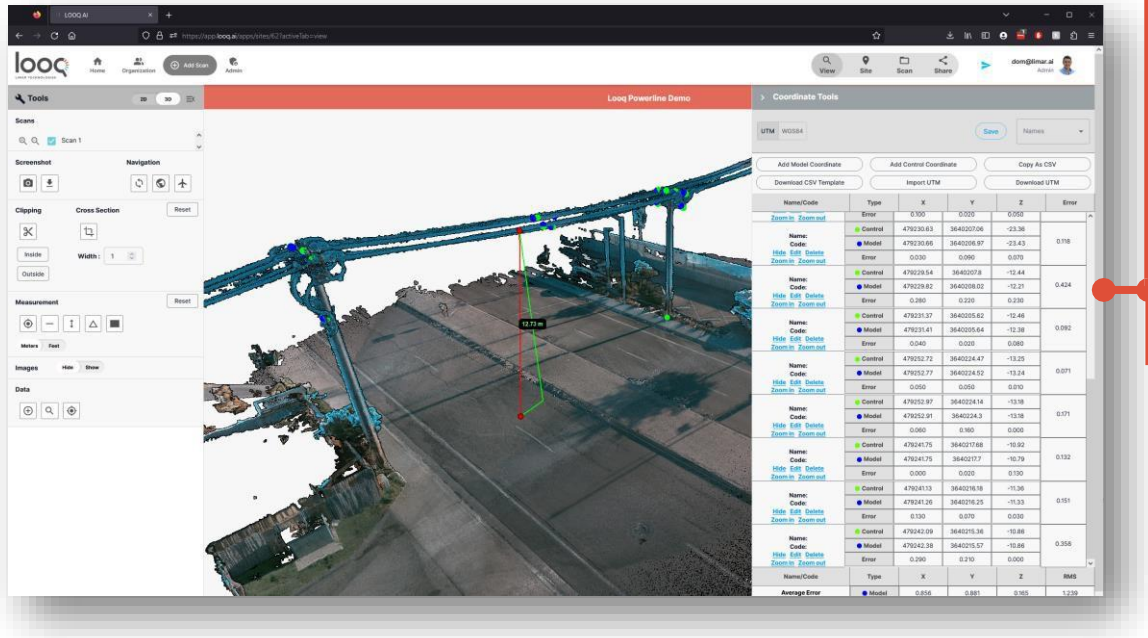



File
Help

Automated creation of 3D Digital Twins

3D analysis

Field data collection

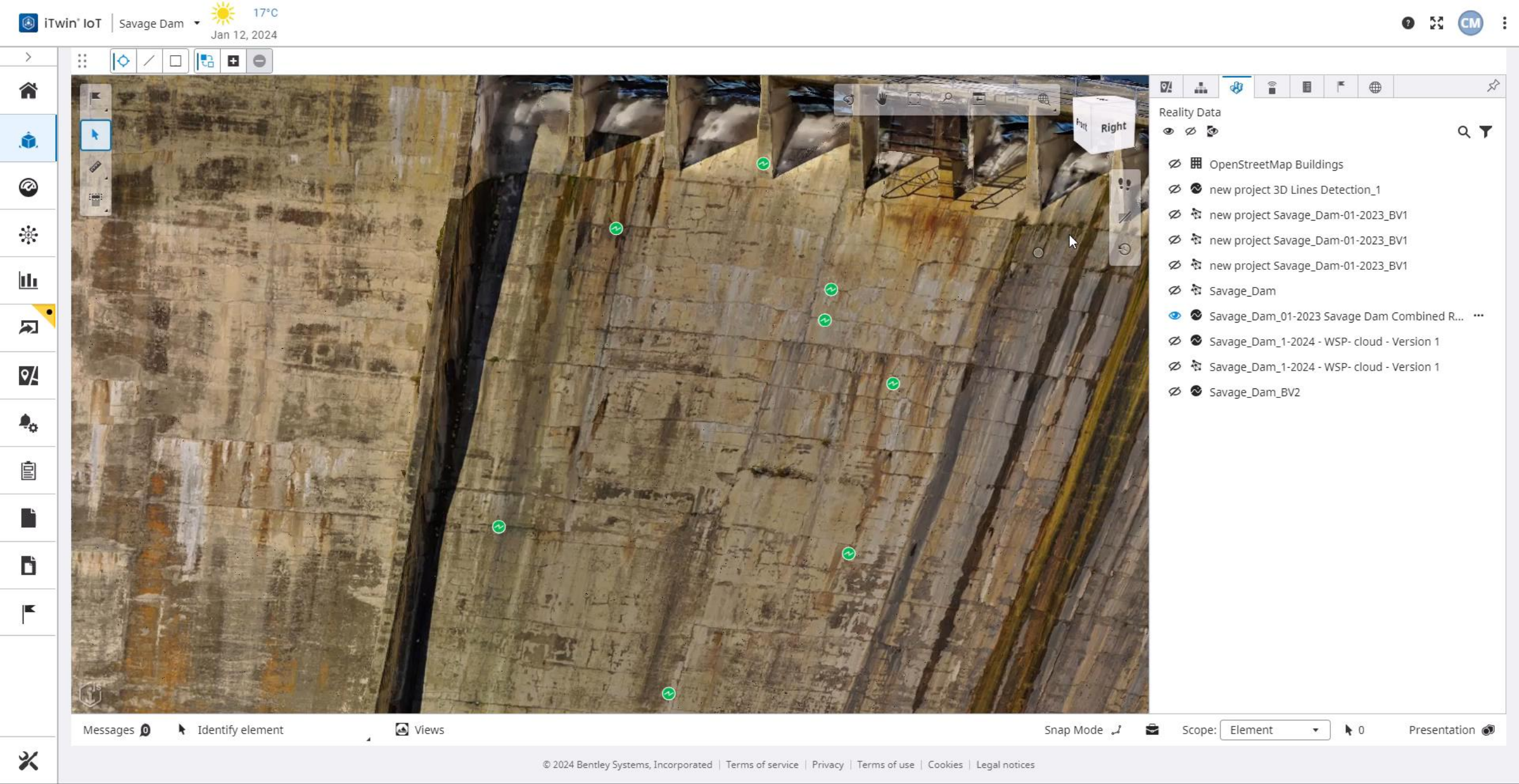


Visualize, analyze and coordinate

Automatically create survey reports and asset inventories

Share, and integrate into CAD and design tools

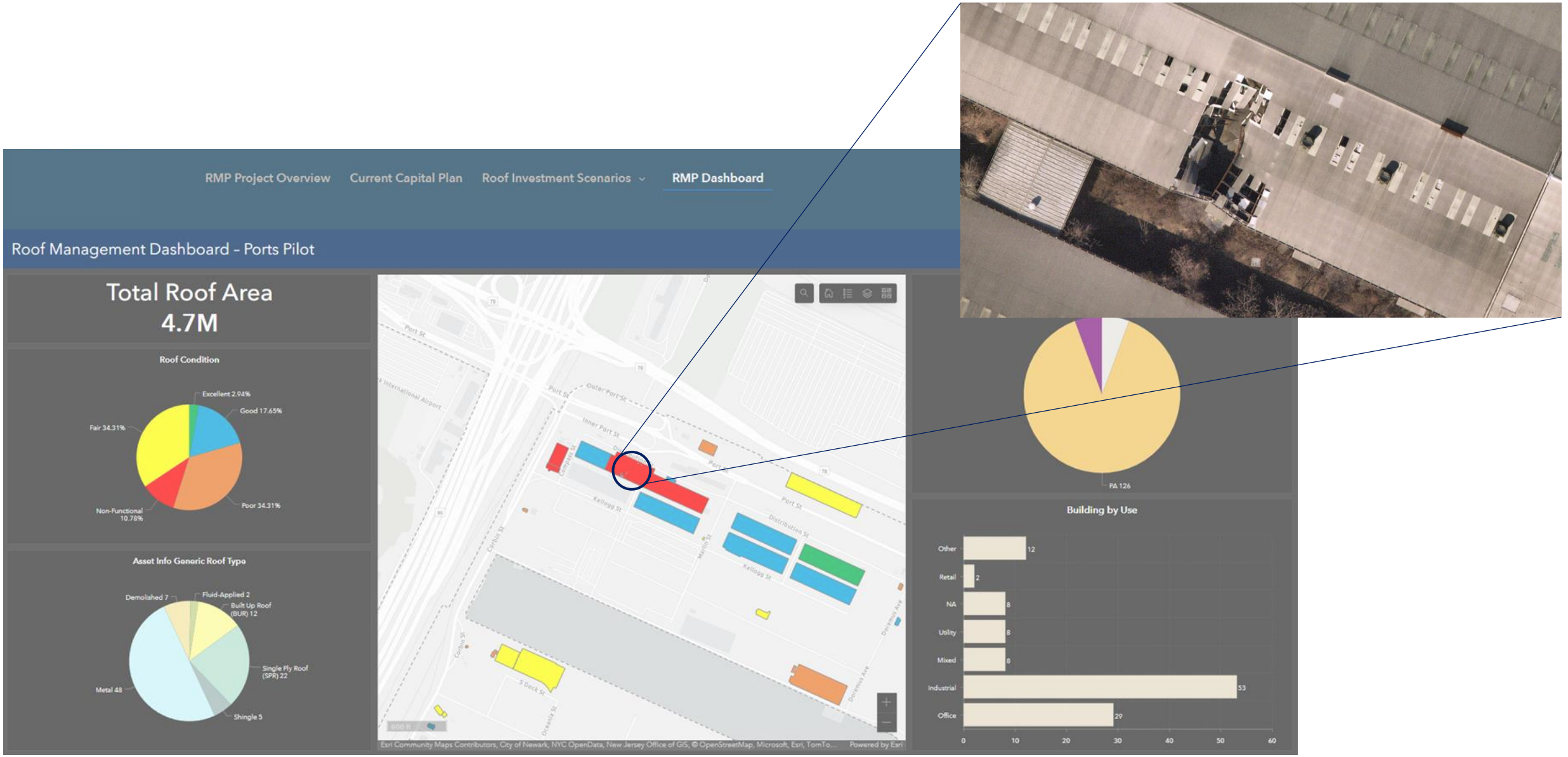
source: looq.ai



Saving Energy Through Automated Building Exterior Inspection

AI-powered envelope diagnostics to accelerate the transition to Net Zero buildings.

source: lamarr.ai

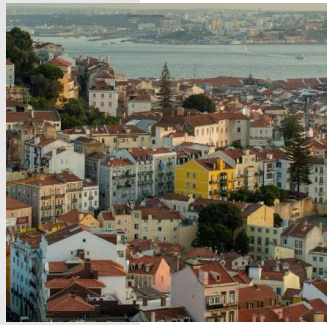

RMP Project Overview
Current Capital Plan
Roof Investment Scenarios
RMP Dashboard
Roof Management Dashboard – Ports Pilot
Total Roof Area
4.7M
Roof Condition
Excellent 2.94%
Good 17.65%
Fair 34.31%
Poor 34.31%
Non-Functional 10.78%
Asset Info Generic Roof Type
Demolished 7
Fluid-Applied 2
Built Up Roof (BUR) 12
Single Ply Roof (SPR) 22
Metal 48
Shingle 5
Port St
Outer Port St
Inner Port St
Kellogg St
Distribution St
Esri Community Maps Contributors, City of Newark, NYC OpenData, New Jersey Office of GIS, © OpenStreetMap, Microsoft, Esri, TomTo...
Powered by Esri
PA 126
Building by Use
Other 12
Retail 2
NA 8
Utility 8
Mixed 8
Industrial 53
Office 29
0
10
20
30
40
50
60

The New York City Housing Authority (NYCHA) manages 335 developments, housing over 530,000 residents.

THE RESIDENT POPULATION IS LARGER THAN MANY CAPITAL CITIES

Wellington, New Zealand

212,000



Lisbon, Portugal

509,000

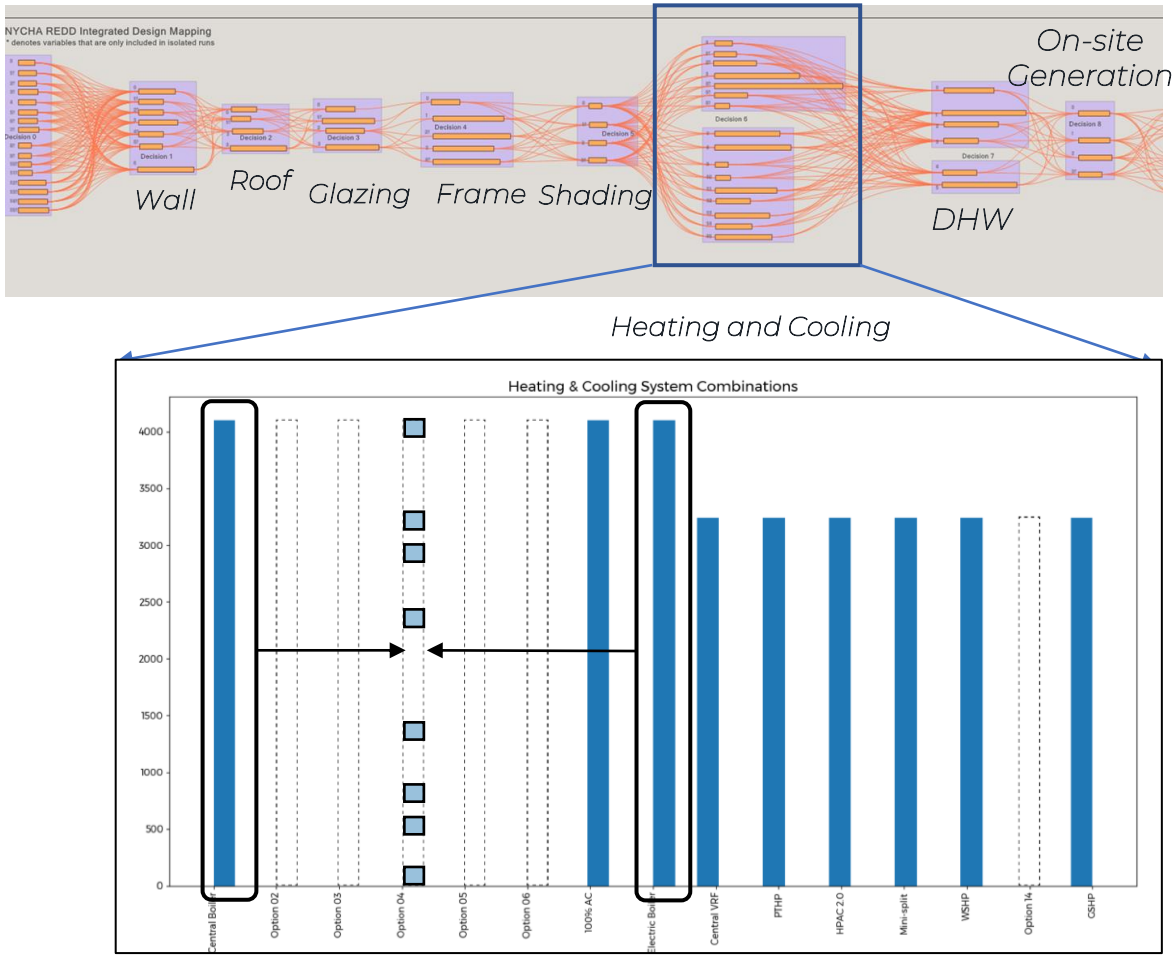
San Jose, Costa Rica

342,000

Surrogate Modeling

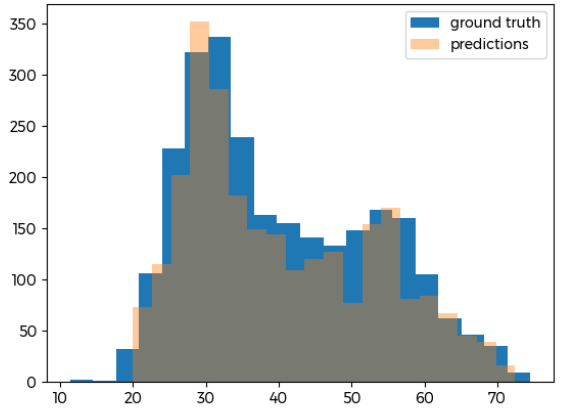
The number of possible iterations was in the billions, which was impossible to simulate. ***However, we can train a model to fill the gaps using the surrounding data.***

Simulation Possibility Space

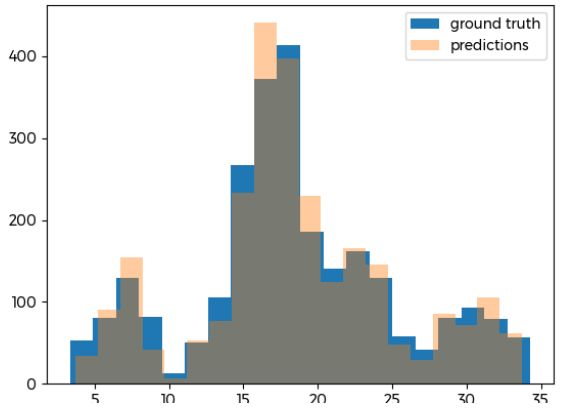


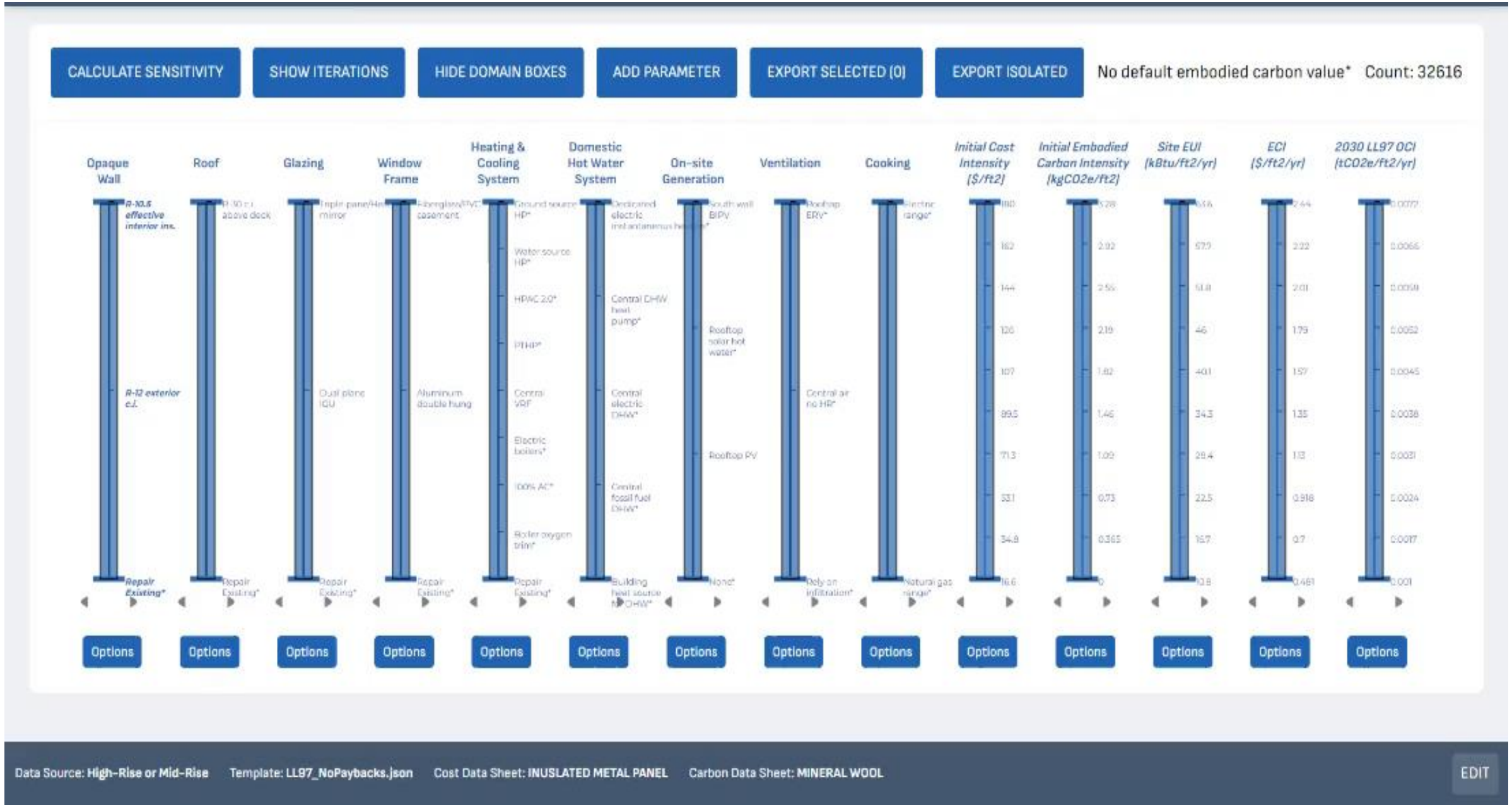
Predicted vs Ground Truth

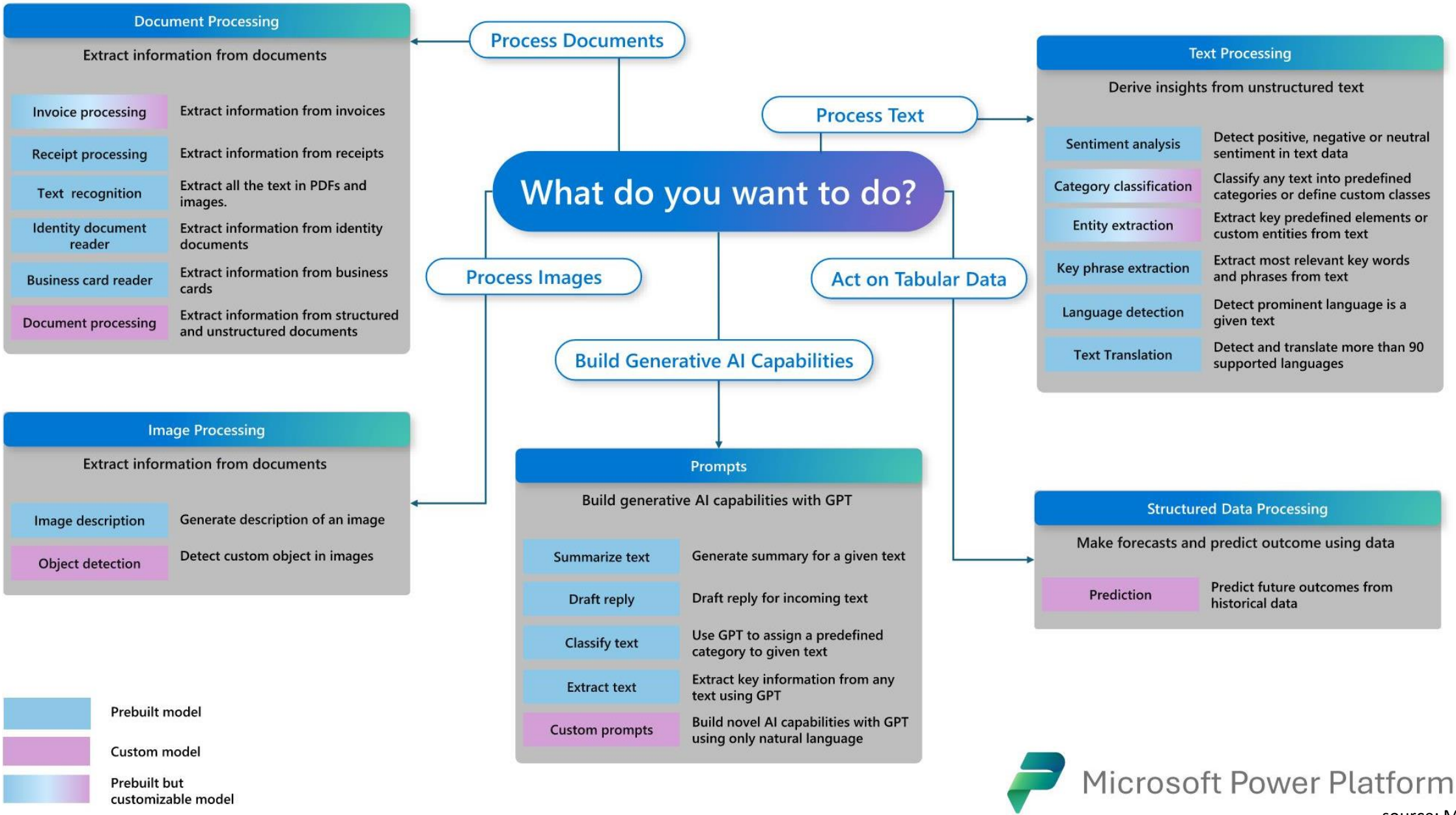
Site Energy Use Intensity



Electrical Use Intensity




CALCULATE SENSITIVITY
SHOW ITERATIONS
HIDE DOMAIN BOXES
ADD PARAMETER
EXPORT SELECTED (0)
EXPORT ISOLATED
No default embodied carbon value*
Count: 32616
Opaque Wall
Roof
Glazing
Window Frame
Heating & Cooling System
Domestic Hot Water System
On-site Generation
Ventilation
Cooking
Initial Cost Intensity ($/ft2)
Initial Embodied Carbon Intensity (kgCO2e/ft2)
Site EUI (kBtu/ft2/yr)
ECI ($/ft2/yr)
2030 LL97 OCI (tCO2e/ft2/yr)
R-10.5 effective interior ins.
R-12 exterior c.i.
Repair Existing*
Repair Existing*
Triple pane/Heat mirror
Dual plane IGU
Repair Existing*
Fiberglass/PVC casement
Aluminum double hung
Repair Existing*
Ground source HP*
Water source HP*
HPAC 2.0*
PTHP*
Central VRF
Electric boilers*
100% AC*
Boiler oxygen trim*
Repair Existing*
Dedicated electric inst.antaneous
Central CHW heat pump*
Central electric DHW*
Central fossil fuel DHW*
Building heat source for DHW*
South wall BIPV
Rooftop solar hot water*
Rooftop PV
None*
Rooftop ERV*
Central air no HR*
Rely on infiltration*
Electric range*
Natural gas range*
Options
Data Source: High-Rise or Mid-Rise
Template: LL97_NoPaybacks.json
Cost Data Sheet: INUSLATED METAL PANEL
Carbon Data Sheet: MINERAL WOOL
EDIT



Microsoft Power Platform

source: Microsoft


Gordie Howe
International Bridge

Epson ScanSmart

Scanning (page 19)..

Scan


13


14


15

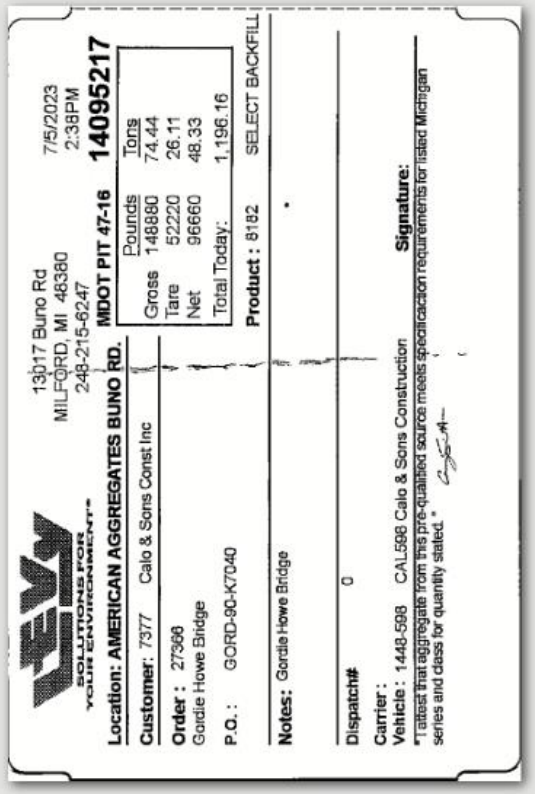

16


17


18


19

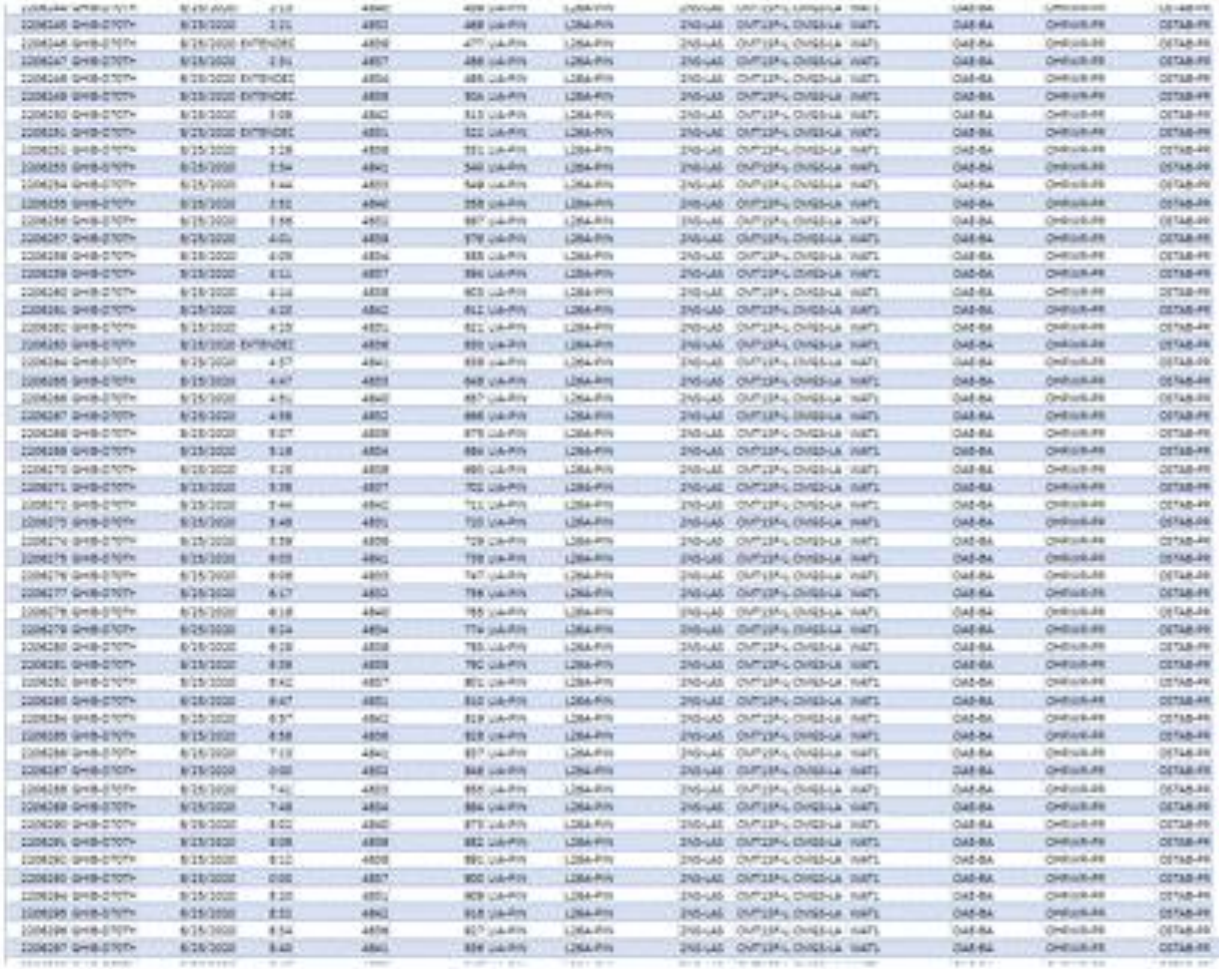
Total selected : 1

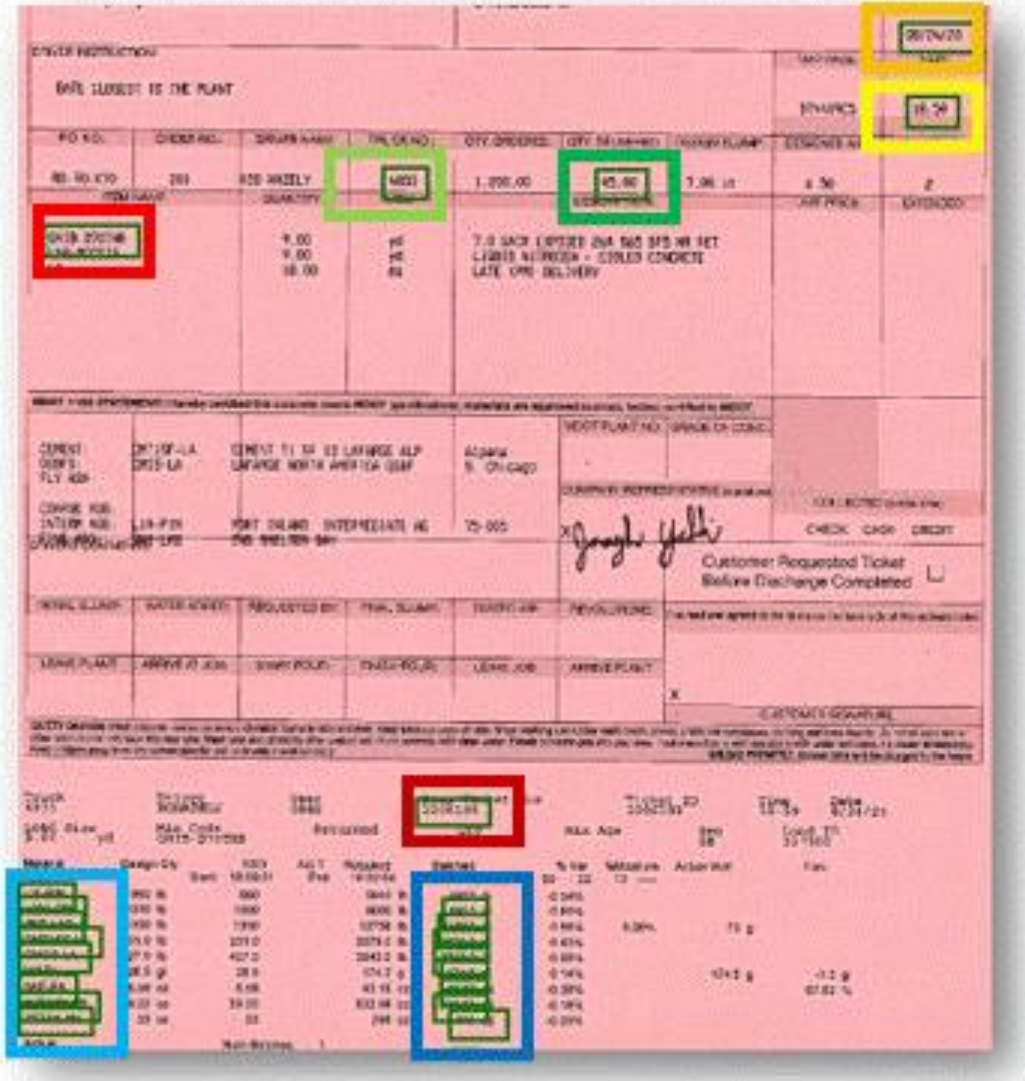


Skip this screen next time.

Progress

Microsoft AI Builder





WSP Canopy | WDS-Gordie Howe International | AI Readings_DontChangeAnythin | AI Readings_DontChangeAnythin | gowrdihowe international bridge

https://wsponline.sharepoint.com/:x:/r/sites/WDS-GHIB/_layouts/15/Doc.aspx?sourcedoc=%7BA20774B5-3454-45DC-A427-C140FE4E41E8%7D...

AI Readings_DontChangeAnything

Search for tools, help, and more (Alt + Q)

File Home Insert Share Page Layout Formulas Data Review View Automate Help Draw

Comments Catch up Editing Share

Undo Paste Clipboard Calibri (Body) 11 Font Wrap Text Merge & Center Alignment General Number Conditional Formatting Format As Table Cell Styles Styles Insert Delete Format Cells AutoSum Clear Sort & Filter Find & Select Editing Add-ins Add-ins Get Jira Data Jira Cloud

A173

	JointID	Member1/2	RC Set	Qty Installed	Date Stuffed	Date Snugged	Date Tensioned	Date QA Testing	Detai
29	U03- EG-S5-S- Web	U02EG123/U03EG122	2022-38956	100	04/08/2022	15/08/2022	15/08/2022	20/06/2023	Detai
30	U03- EG-S5-N- Bottom	U02EG522/U02EG523	2022-39120	46	13/08/2022	15/08/2022	15/08/2022	09/06/2023	Detai
31	U03- EG-S6-S- Bottom	U03EG122/U03EG121	2022-38948	16	23/08/2022	25/08/2022	21/09/2022	04/03/2023	Detai
32	U03- EG-S5-N- Top	U02EG523/U03EG522	2022-38945	42	16/08/2022	16/08/2022	16/08/2022	05/01/2023	Detai
33	U03- EG-S5-N- Bottom	U02EG522/U01EG523	2022-39120	2	16/08/2022	16/08/2022	16/08/2022	09/06/2023	Detai
34	U03- EG-S6-S- Bottom	U03EG122/U03EG121	2022-38948	58	25/08/2022	25/08/2022	21/09/2022	04/03/2023	Detai
35									
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51									

Sheet1

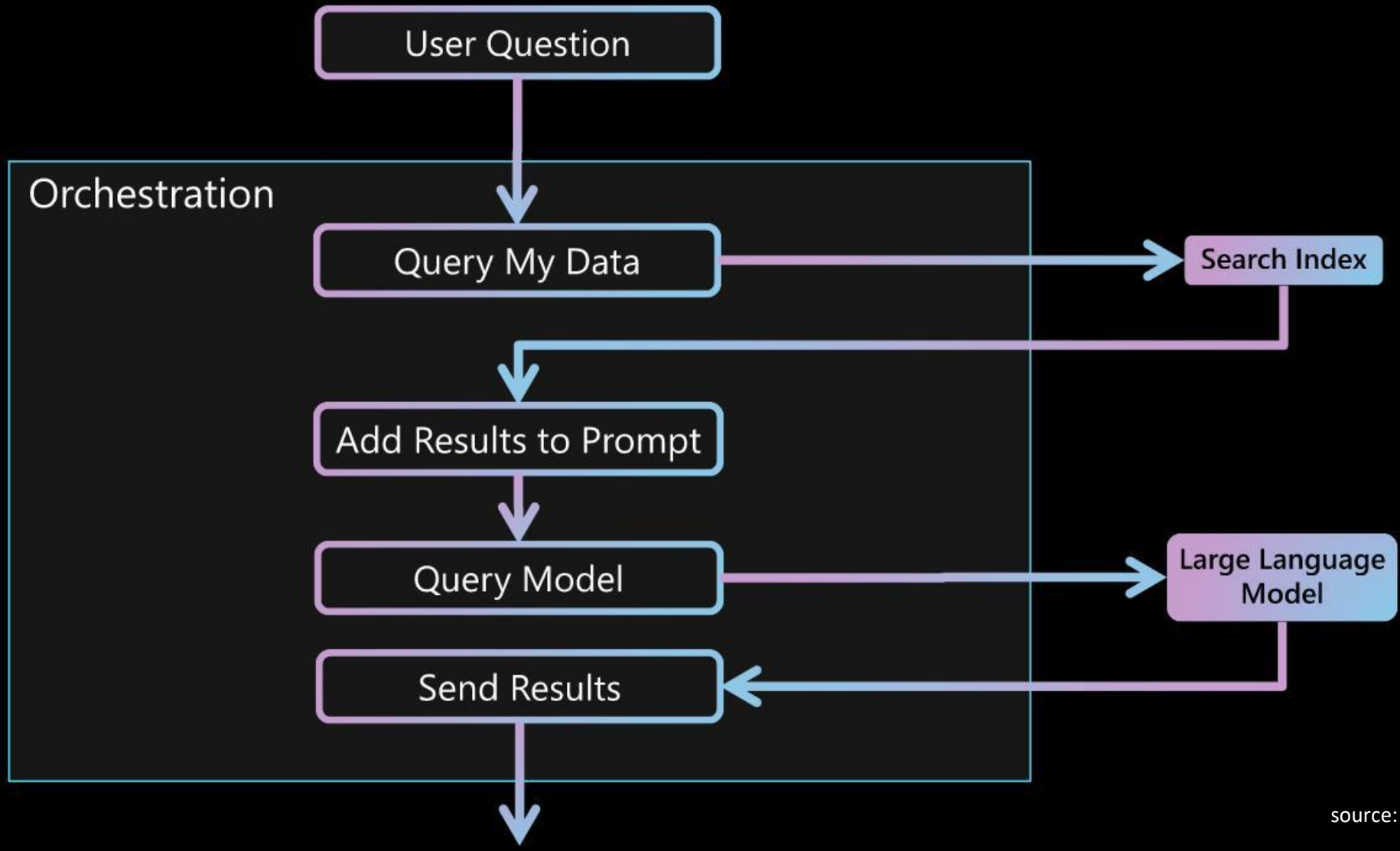
How to calculate the maximum stress at the boundary of a tunnel?

To calculate the maximum stress at the boundary of a tunnel, its essential to understand the factors that influence stress concentration around tunnel boundaries and how these stresses can be determined through both theoretical and numerical methods

1. understand maximum tangential stress
2. numerical parameters and geometry considerations
3. in situ stress fields

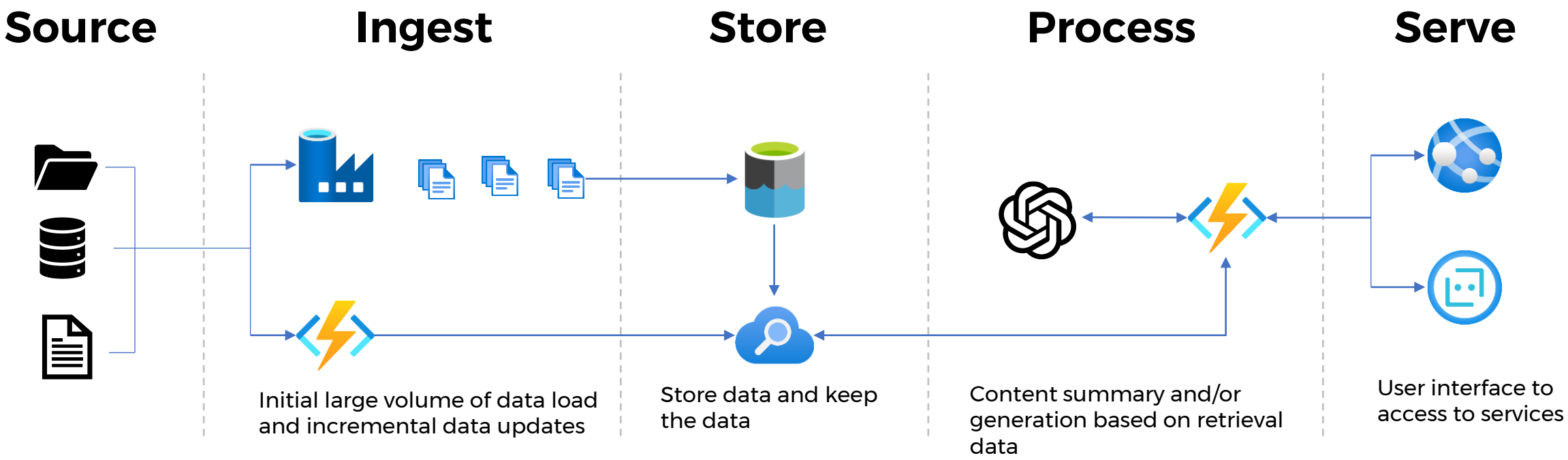
Generated by AI

Retrieval Augmented Generation



source: Microsoft

Conceptual Architecture

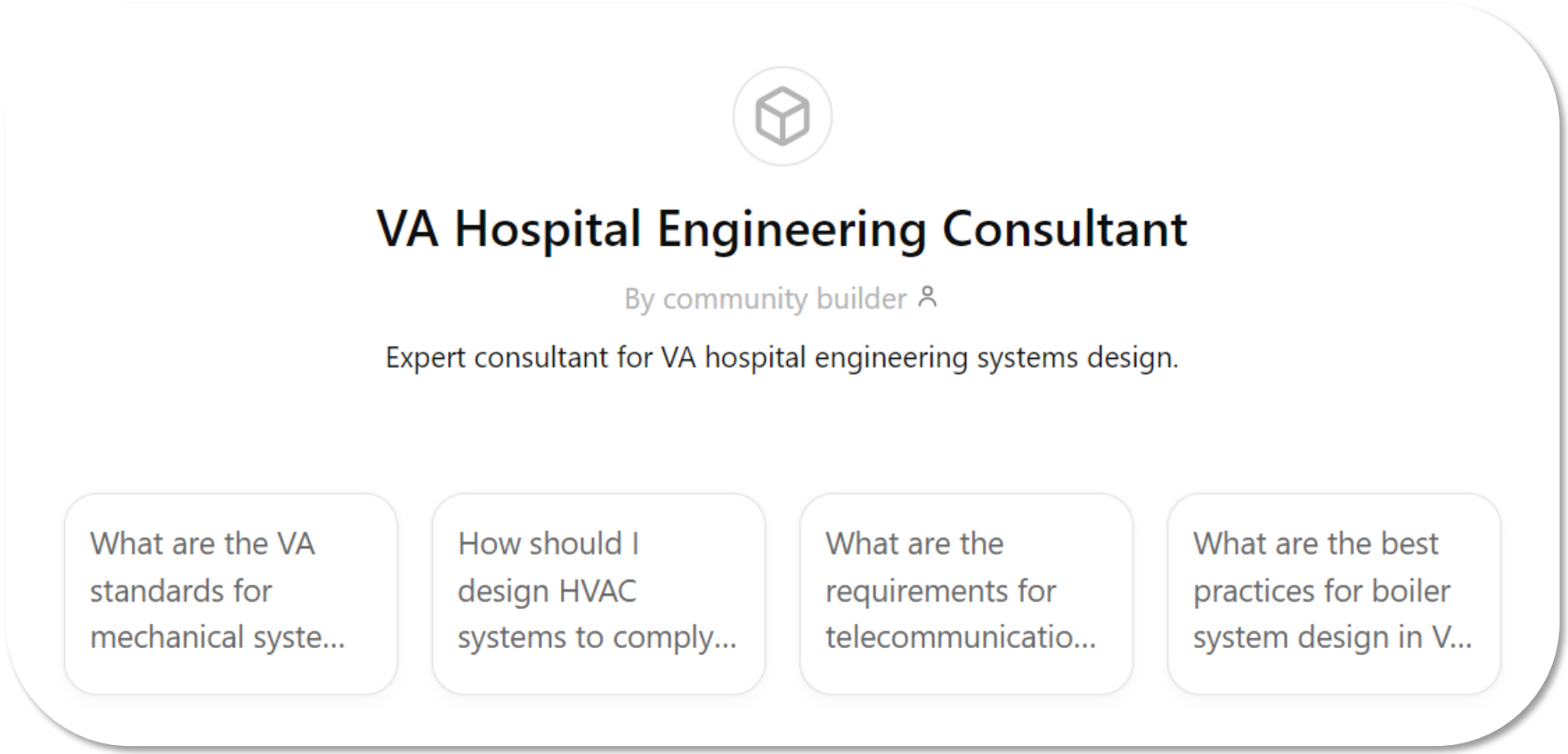


source: Microsoft

image generation demo

Generated by AI

Custom GPT demo



STANDARD

ANSI/ASHRAE/ASHE Standard 170-2021
(Supersedes ANSI/ASHRAE/ASHE Standard 170-2017)
Includes ANSI/ASHRAE/ASHE addenda listed in Appendix F

Ventilation of Health Care Facilities

Can we compare standards
in 90 seconds…

Generated by AI

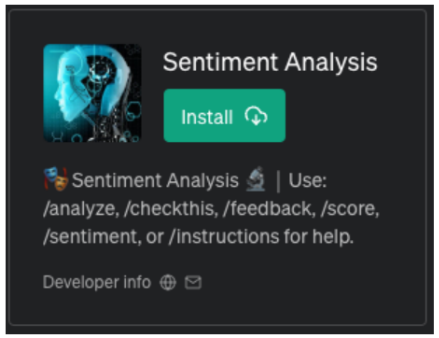
Sentiment Analysis

Sentiment Analysis - New plugin for ChatGPT

API chatgpt, api, plugin-development, chatgpt-plugin

MadieLaine Aug 2023

Sentiment Analysis



Overview

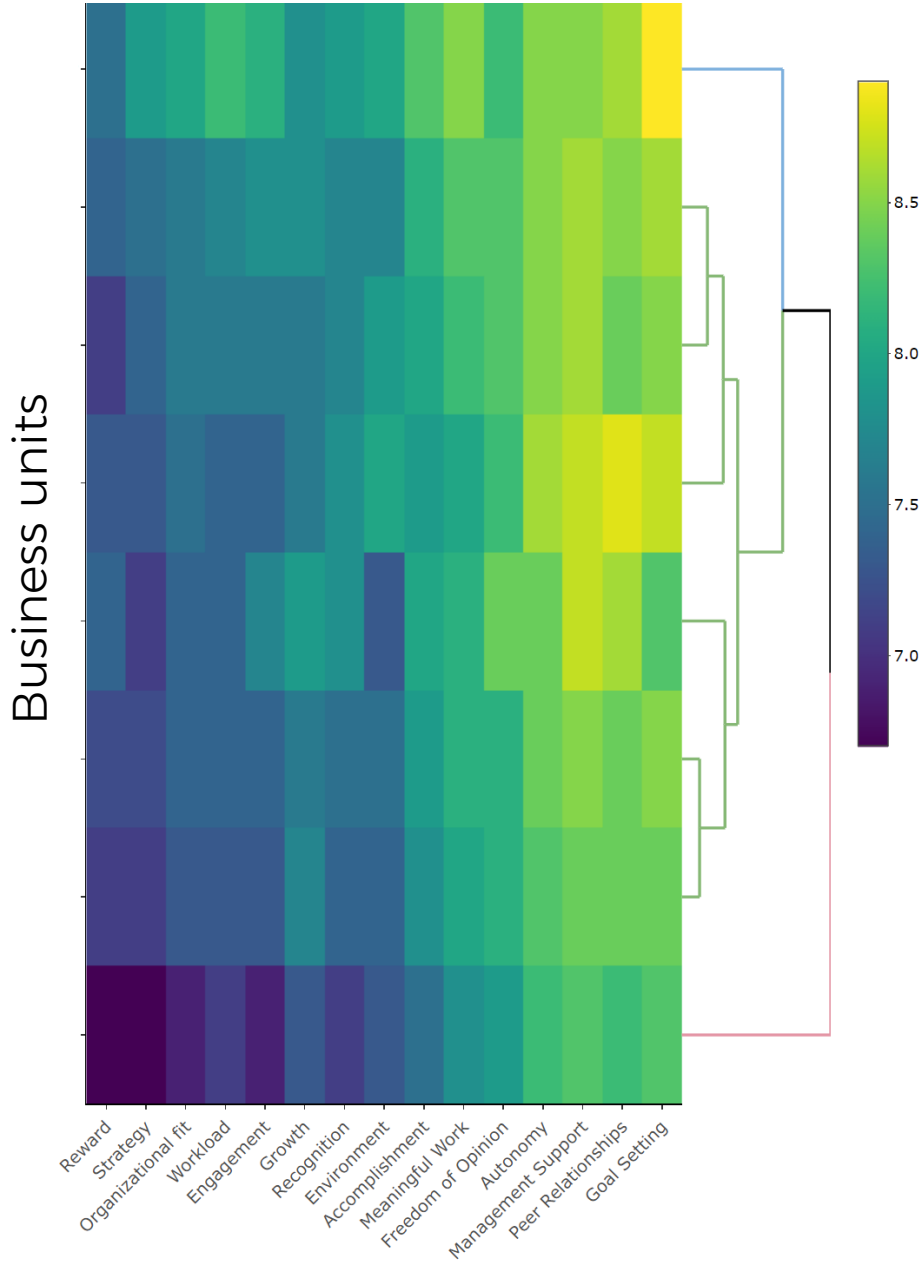
The Sentiment Analysis plugin is a powerful tool that allows users to perform in-depth sentiment analysis on any text leveraging large language models. Whether you need to understand customer feedback, analyze user comments, or explore the emotional tone of a text, this tool offers a range of functionalities to suit your needs. Explore below to find out how you can unleash the power of sentiment analysis with ease!

Aug 2023

1 / 2

Aug 2023

Mar 26



No Regret Moves

1

Data, data, data.

Your ability to create AI differentiators is built on a foundation of unique data.

If you don't have a project data strategy, you probably need one.

Get a handle on data rights and IP.

2

Play with purpose

Understand what problems you are trying to solve

Define process for evaluating success

Don't underestimate training needed.

Provide a venue for sharing ideas between employees

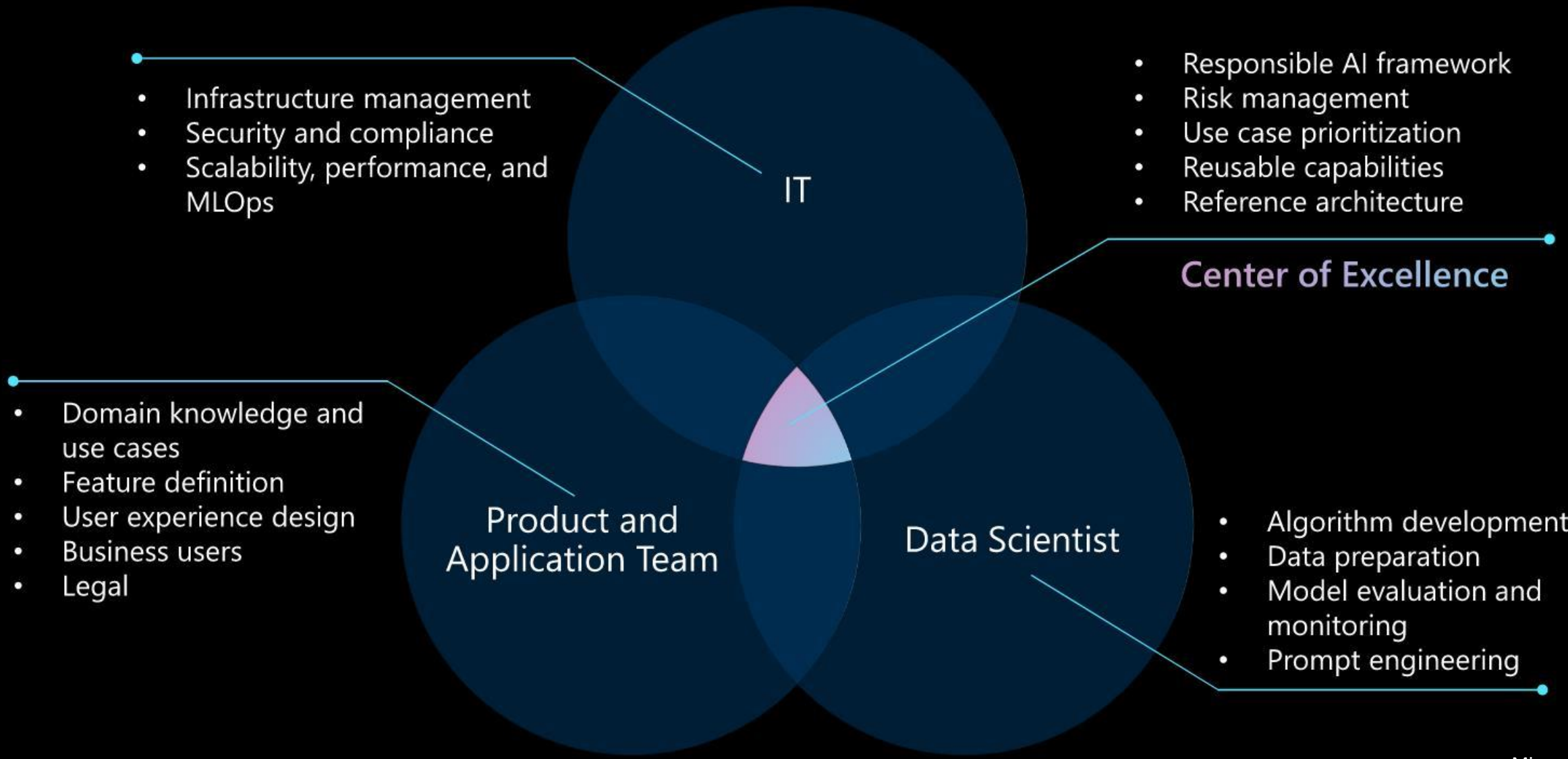
3

Get governance in place

Our industry is still coming to terms with AI, make sure you're keeping an eye on the shop.

Track regulatory requirements, states like California are now requiring AI disclosure.

Centralized, cross functional AI platform team



source: Microsoft

Future state

Agents

Storytellers

Wizards

Generated by AI

How do we get there

Upskilling

New Business Models

Partnerships

Generated by AI


Questions?
april.woods@wsp.com
jay.wratten@wsp.com
Generated by AI